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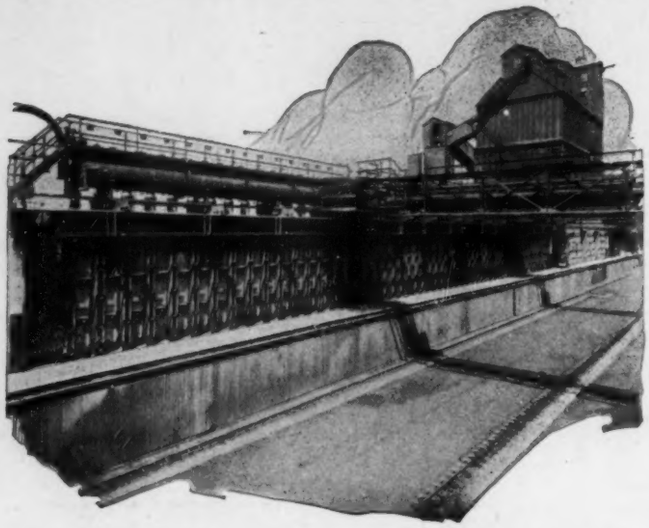


The Following Companies Are Being Served With Koppers Becker Type Combination Coke and Gas Ovens

PLANTS IN OPERATION

	Location	No. of Ovens	Annual Car Cap.—Tons
Chicago By-Product Coke Co.	Chicago, Illinois	5	42,413
Weirton Steel Company	Weirton, West Virginia	37	392,375
Battle Creek Gas Company	Battle Creek, Michigan	11	54,000
Columbia Steel Corporation	Provo, Utah	33	365,000
Consumers Power Company	Saginaw, Michigan	19	72,000
Trumbull Cliffs Furnace Co.	Warren, Ohio	47	441,600
Diamond Alkali Company	Painesville, Ohio	23	204,400
Bethlehem Steel Company	Buffalo, New York	114	940,800
Winnipeg Electric Company	Winnipeg, Canada	17	84,388
Utica Gas & Electric Company	Utica, New York	21	104,244
Northern Indiana Gas & Electric Co.	Fort Wayne, Indiana	19	94,316
By-Products Coke Corporation	South Chicago, Illinois	110	1,000,000
Carnegie Steel Company	Clairton, Pennsylvania	366	2,743,048
Consumers Power Company	Jackson, Michigan	15	50,000
Republic Iron & Steel Company	Youngstown, Ohio	61	621,800
Lynn Gas & Electric Company	Lynn, Massachusetts	11	54,000
Republic Iron & Steel Company	Birmingham, Alabama	57	720,500
Illinois Steel Company	Gary, Indiana	138	1,259,250
Rochester Gas & Electric Corp.	Rochester, New York	60	273,885
Jones & Laughlin Steel Corp.	Aliquippa, Pennsylvania	122	1,100,000
Inland Steel Company	Indiana Harbor, Indiana	73	620,916
Total ovens in operation		1,359	11,238,935

PLANTS UNDER CONSTRUCTION

Consolidated Gas Co.	New York, New York	74	638,750
Utica Gas & Electric Company	Utica, New York	21	104,244
Wheeling Steel Corporation	Follansbee, W. Va.	51	347,000
Weirton Steel Company	Weirton, West Virginia	49	438,000
Central Furnace Company	Massillon, Ohio	49	438,000
Republic Iron & Steel Company	Youngstown, Ohio	43	400,500
Bethlehem Steel Company	Johnstown, Pa.	77	570,000
West Boston Gas Company	Framingham, Mass.	15	47,523
Tennessee Coal, Iron & Railroad Co.	Fairfield, Ala.	63	657,000
Diamond Alkali Company	Painesville, Ohio	23	227,030
Carnegie Steel Company	Clairton, Pennsylvania	348	3,887,250
Bethlehem Steel Company	Buffalo, New York	57	520,125
Consumers Power Company	Flint, Michigan	29	135,500
Alabama By-Products Corporation	Birmingham, Ala.	49	500,000
Total ovens under construction		948	8,410,922
GRAND TOTAL		2,284	19,539,851

The Koppers Company

Pittsburgh, Penna.

Chicago, Ill. **New York City**

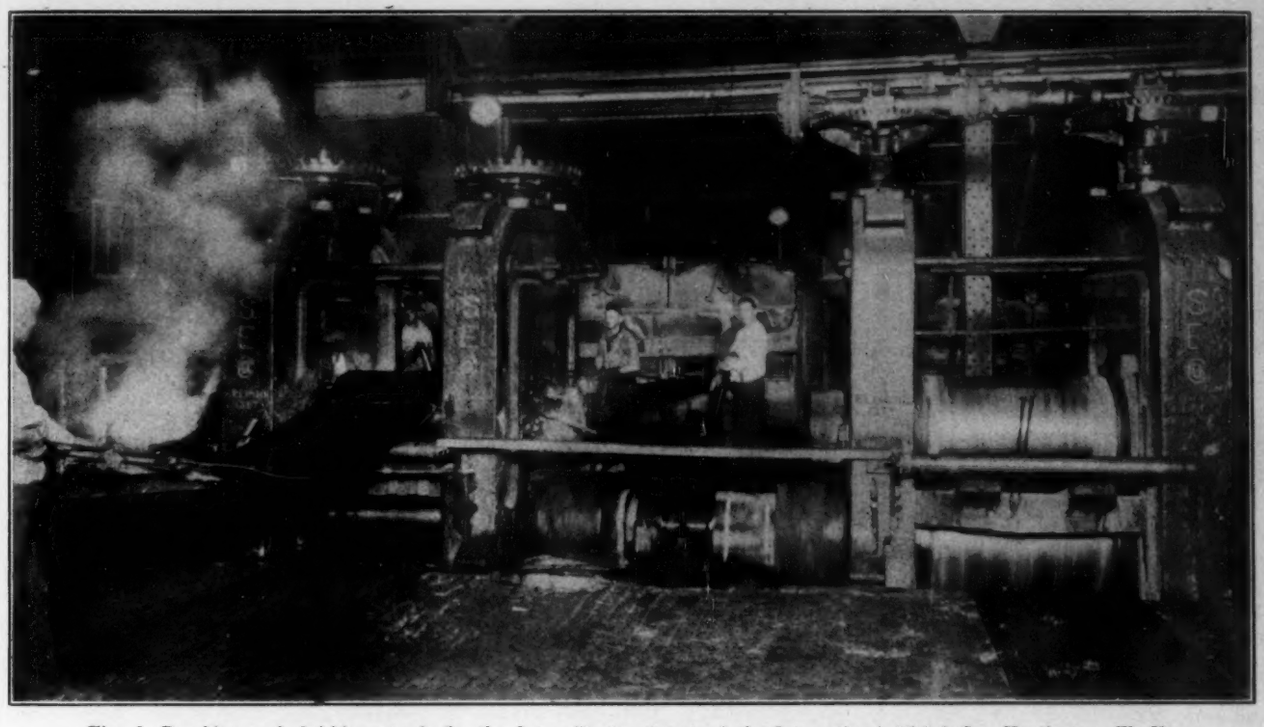


Fig. 1—Roughing and finishing stands in the hot mill department of the International Nickel Co., Huntington, W. Va.

Latest Methods of Heat Treating Are Applied To Nickel and Its Alloys

By F. M. Manker

HEAT treating of steel and its various alloys as well as nonferrous metals, is one of the newest sciences and at the same time one of the most far reaching in its effect on modern civilization. The gradual transition of heat treating from an art to a science with the duplication of laboratory conditions on a commercial scale has made possible economical mass production of a wide variety of metal products that formerly was unattainable. Working hand in hand with metallurgist to achieve this end has been the manufacturer of furnaces and combustion apparatus for the correct application of heat to the many processes involved.

MUCH of the remarkable increase in the use of nickel in recent years is due to progress in the metallurgy of the metal, which in turn has affected methods of heat treatment. Equipment and practice of the largest producer are described in the accompanying article. The author is associated with the Surface Combustion Co., New York.

No metal has received greater benefit from the scientific progress in heat treating than nickel and its alloys. The nickel industry is just half a century old and, previous to the disarmament agreement, 60 per cent of the nickel produced went into nickel steel, most of which was used for large guns and battleships. Today, however, only 2 per cent is used for ordnance, and the greater part goes into the manufacture of automobiles, engines, bridges, general machinery, etc. Nickel also is used in combination with chromium in a nickel-chrome steel.

The natural nickel-copper alloy, 68 and 29 per cent respectively, is known as monel metal and is the most important of the nonferrous nickel alloys. Others include constantin for electrical instruments and cupronickel for bullet jackets and coinage. Nickel alloys with chromium or chromium and iron are used as the heat-resisting elements in electrical stoves, toasters, etc. Nickel is employed also in cast-iron for toughness and in bronze bearings for durability. Among the many uses for pure nickel are listed nickel plating, nickel coating, utensils, pasteurizing equipment, etc. Monel metal is an important corrosion-resisting alloy, because it com-

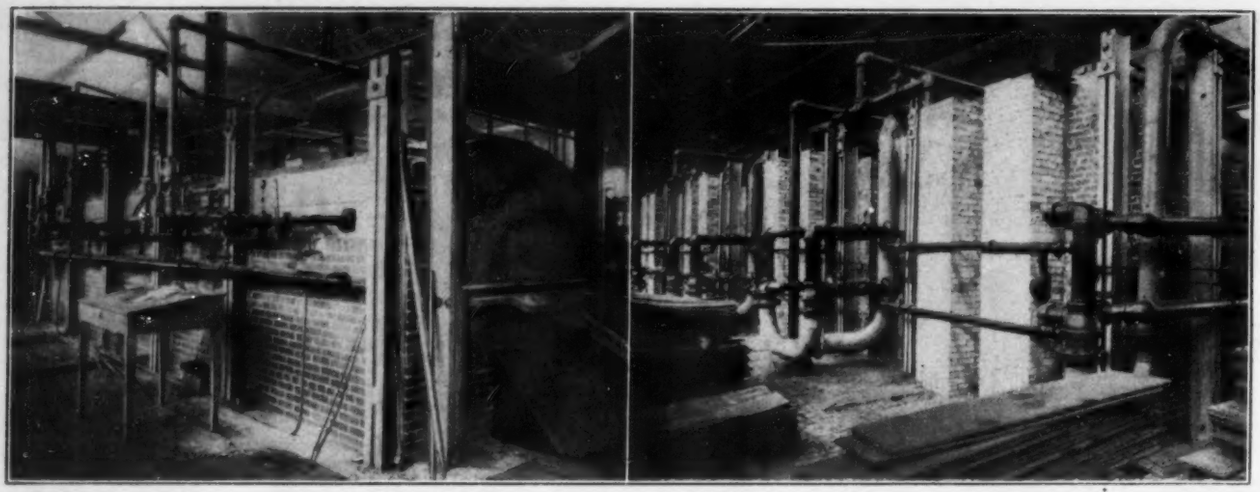


FIG. 2 (LEFT)—VIEW OF BRIGHT ANNEALING FURNACES SHOWING CARBON MONOXIDE CONTROL SYSTEM. FIG. 3 (RIGHT)—REAR OF BOX ANNEALING FURNACE SHOWING ARRANGEMENT OF GAS FIRING INSTALLATION

bines high mechanical properties with its remarkable resistance to corrosion in most acids and the atmosphere.

Its strength is more than twice that of copper and equals that of mild steel, while its durability is much greater than that of steel, permitting greater facility in fabrication, such as spinning, stamping, drawing etc. This metal was named after the late Ambrose Monel, president of the International Nickel Co. in 1905. Its tensile strength is 85,000 pounds per square inch while that of nickel is 75,000 pounds.

Bulk Produced in America

More than 80 per cent of the nickel and all of the monel metal made in the world is produced by the International Nickel Co. which has nickel mines in Sudbury, Canada, smelters at Copper Cliff, Canada, refineries at Fort Colborne, Ontario, Canada, and refineries and rolling mills at Huntington, W. Va. Practically all of the furnaces in the Huntington plant are fired by gas and were designed, manufactured and installed by the Surface Combustion Co., New York.

The bessemer matte containing approximately 55 per cent nickel, 25 per cent copper, 20 per cent sulphur and less than 0.4 per cent iron, is shipped from Port Colborne to the Huntington plant, where it is crushed in jaw crushers, ground in ball mills and calcined. The latter process is accomplished in four gas-fired furnaces. Each of these furnaces is 75 feet long, 15 feet wide and 30 inches from hearth to crown of arch, fired by six burners located at the discharge end, where the temperature is 2300 degrees Fahr. This temperature becomes less as the hot gases pass along, until at the charging end it is only 500 degrees Fahr. Here the hot gases go down under the hearth and return to the discharge end, where they pass out through a stack. Excess air is forced in to effect oxidation and all the sulphur is burned out. The powder is moved through the furnace by 30 water-cooled arms on vertical shafts extending through the roof and driven by a lineshaft fitted with gears.

The product then is sent to the refinery, where it is mixed with charcoal to reduce the oxide and melted in two 25-ton and two 6-ton gas-fired open-hearth furnaces, and one 7-ton and one 3½-ton electric furnace. The large gas fired open hearth is 18 feet long, 6 feet wide, 36 inches from hearth to arch crown and has a 7-foot combustion chamber. It is fired from front to back by 6 burners at a temperature of 2900 to 3000 degrees Fahr. This open hearth is charged through hoppers at the top with the oxide mixed with charcoal, and in from 16 to 20 hours the pure molten metal is tapped from the side into a ladle. Magnesium is added, 1 ounce to 200 pounds, to complete deoxidation, after which the metal is poured into 2-ton ingots 14 x 14 x 60 inches. The flue gases from these open hearths are utilized in a 600-horsepower waste heat boiler and superheater and the steam power is used for various purposes. At these high temperatures great economy is obtained through the reduction of the refining operation to a single furnace treatment. In fact, this is one of the few instances where direct oxide reduction with charcoal has been accomplished in a single operation.

The monel metal ingots, after being stripped from the molds and having their piped tops sawed off, are scarfed in milling machines which make a cut 8 inches wide and ¼-inch deep. Following this smoothing process, any remaining imperfections are chipped out by hand with air operated hammers.

The ingots are taken to the forging department where they are heated and forged down to blooms for sheet bars and rods. This is accomplished by four steam hammers of 16,000, 10,000, 3500 and 1500-pound capacities, respectively. The heating is done in five gas-fired furnaces, each 7 feet wide, 30 feet long and 5 feet from hearth to crown. The hearth is paved with pure nickel brick, which last a life time and prevents the possibility of sand adhering to the ingots. Each furnace will take six ingots at a charge, is fired from the back by 18 burners and is heated to about 2100 degrees Fahr. for monel metal, and to 2200 degrees Fahr. for pure nickel. The ingots remain in this heat for about 2 hours. To prevent oxidation and deterioration, a reducing atmosphere must be maintained. This is accomplished by adjusting the automatic gas-air proportioning control to the proper ratio for incomplete combustion, admitting 0.5 per cent carbon monoxide. The design of these burners is such that a minimum of effort on the part of the furnace operators is required to maintain the best forging conditions.

Maintains Reducing Temperature

The next step is through the rolling mills to reduce the blooms to billets or sheet bars. Here are seven gas-fired heating furnaces one 10 x 30 feet; three 10 x 20 feet, and three 8 x 14 feet, all 5 feet from hearth to crown. These furnaces are fired to about 2100 degrees Fahr. and a reducing atmosphere is maintained. From 9 to 18 burners are used on each furnace, which will hold from 12 to 40 billets depending upon their respective sizes. It takes from 45 minutes to 2 hours to heat these billets.

When heated, the 8 x 8-inch blooms

are reduced in the 24-inch mill to 3 x 3-inch billets or 4¼ x 6-inch slabs; in the 20-inch mill to 2 x 4-inch billets and flats wider than 2½ inches; in the 14-inch mill to 1 and 2-inch bars and flats wider than 1 inch; in the 10-inch mill to ½ and 1-inch rounds and flats under 1 inch; and in the rod mill to ¼-inch wire rods. This ¼-inch wire rod is the basic product for the cold drawing wire industry.

On the other hand, the 4 x 11-inch blooms are rolled into sheet bars in the 24-inch mill, from whence they go to the sheet mill to be rolled into gages of from 3 to 26, width up to 48 inches and lengths up to 156 inches. Four sheet and two pair furnaces fired with gas are used. The pair furnaces are each 15 feet long, 9 feet wide and 5 feet from hearth to crown, have 4 doors and will hold 24 sheet bars 11 inches wide and from 5/16 to 2 inches thick. They are fired by 3 burners in each end to about 2100 degrees Fahr. and a reducing atmosphere is maintained. It takes from 30 to 45 minutes to bring the bars up to heat.

The sheet furnaces are 16 feet wide, 15 feet long and 5 feet high, fired by 6 burners in the back wall and divided into 2 compartments. A temperature of 1700 to 1900 degrees Fahr. is maintained and it requires from 5 to 10 minutes to bring the material up to heat.

The finished sheets are then box-annealed at from 1400 to 1600 degrees Fahr. for about 36 hours, cooled, pickled in a solution of sulphuric acid in a pickling machine, washed, and dried by rolls and a gas-fired scrubber and dryer. They are cold-rolled to obtain a high finish and again box-annealed as before, after which they are flattened in a stretcher leveler, resheared to size and polished, if desired; they then are ready for shipment. The box annealing is done in 6 furnaces 17 feet long, 6 feet wide and 8 feet high, which are gas-fired by 18 burners located in the side and back walls.

Cold Drawn Sections Made

In the cold drawing department, rods from the merchant mill are drawn to squares, hexagons and special shapes, while seamless nickel tubing is drawn to the correct dimensions. This tubing previously has been pierced from billets; the latter are annealed, water quenched and pickled in dilute sulphuric acid, the same as the rods, and then are drawn through dies and over mandrels.

The open or bright annealing furnace, is 30 feet long, 9 feet wide and 4 feet from hearth to crown and is fired by gas through 10 burners on each side. A temperature of 1600 degrees Fahr. is used and a reducing atmosphere is maintained. Inasmuch as this alloy has no critical point similar to that found in steel, it consequently may be cooled rapidly by quenching, without hardening. Furthermore, the alloy comes out bright due to the reducing action of the alcohol which is added to the water.

All of the hardening furnaces are equipped with inspirators which operate under either low or high pressure. Control of combustion, furnace temperature and atmosphere, with a high degree of thermal efficiency, are obtained. In the low pressure system, which is the one used in this plant, air is raised to 1 or 2 pounds pressure by a pressure blower and gas, reduced to atmospheric pressure, is sucked in through an inspirator, or venturi tube. In the high pressure system gas is boosted to 10 pounds by a compressor and air is inspirated in the same kind of venturi tubes. A single valve proportions the gas and air for combustion or for an oxidizing or reducing furnace atmosphere, according to previous determination. A higher efficiency is obtained through a carefully worked out system of radiation, which gives the same amount of heat with less gas consumption. Recording pyrometers give accurate temperature control, while precise furnace atmosphere control is effected through a recording CO meter. Only one furnace at the Huntington plant is now equipped with a CO meter, but many furnaces will have them shortly. They indicate a control that is almost mathematical in its exactness.

A new type of continuous open annealing, or normalizing, furnace is under construction at the Huntington plant, and is designed to take the place of six box-annealing furnaces, without any increase in gas consumption per pound of material heated.

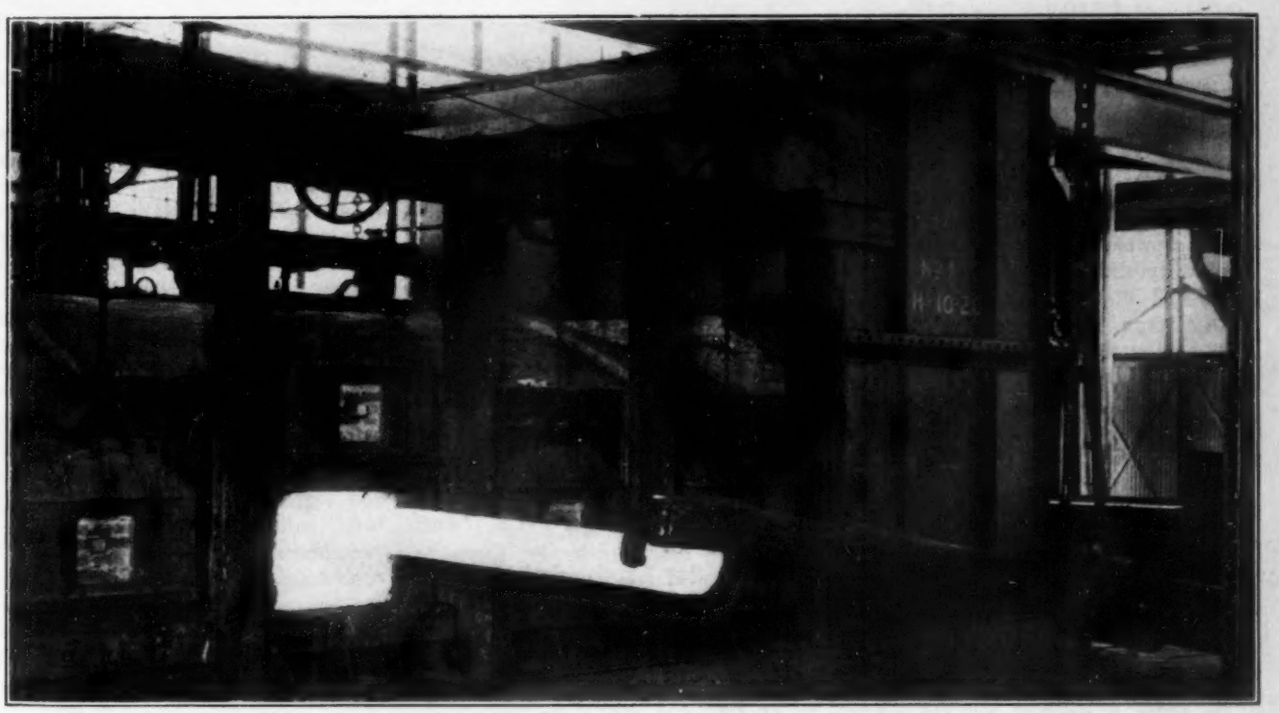


FIG. 4—REMOVING NICKEL BILLET FROM GAS-FIRED HEATING FURNACE. FROM HERE THE BILLET GOES DIRECTLY TO THE STEAM FORGING HAMMER

In fact, this one furnace will have an annealing capacity approximately seven times that of one of the present furnaces. The new unit will be about 70 feet iong, 6 feet wide and 2 feet high, and will be provided with a cooling chamber of the same dimensions. The sheets will be conveyed through on revolving disks mounted on horizontal rotating shafts. Furthermore, the new unit will turn out a sheet of superior usrface and have drawing qualities required by the trade.

What is known as a cluster mill recently has been installed and is the only one of its size in the world. It is used to cold roll sheets for an exceptionally high finish and a duplicate mill is to be built to take care of expanding business, which this superior quality of sheet has created. The mill has two 12-inch forged steel rolls working together, and against each one of these rolls, top and bottom, bears a pair of 26-inch cast-iron rolls. Roughly, this gives 7 times the weight bearing against a sheet as does the ordinary mill.

A strip mill 60 x 275 feet now is under construction which will house six stands of 2-high cold rolls in tandem; five, 16 x 22 inches and one 12 x 18 inches. These are to be driven by direct connected motors through pinion stands by double helical gears. Control is arranged so as to synchronize the double tandem if necessary.

Bosnia's Ore Deposits Worth Billions

By Captain Gordon Gordon-Smith

OF ALL the new states which came into existence as a result of the World war, the Kingdom of the Serbs, Croats and Slovenes, popularly known by the somewhat less cumbersome name of Jugoslavia, offers the greatest field for the exploitation of mineral wealth. This new kingdom was formed by the union of the Serbo-Croat provinces of the former Austrian empire, Croatia, Dalmatia, Slovenia, Bosnia, Herzegovina, the Voivodina and part of the Banat of Temesvar, with the Kingdoms of Serbia and Montenegro. The kingdom has an area of over 100,000 square miles and a population of over 13,000,000.

Eighty per cent of the inhabitants are peasants, each man owning the soil he tills. The country has immense natural resources. One third of the territory is covered with forests, over 25,000,000 acres in extent. The country is immensely rich in gold, silver, mercury, coal, copper, iron manganese, lead, antimony and bauxite. The great obstacle to the development of the mineral wealth has been the absence of means of communication. Under the Austrian regime little or nothing was done to promote the prosperity of the country. The governments of Vienna and Budapest feared that if the country became rich and prosperous, it would become increasingly race conscious and would resist efforts of Austrians and the Magyars to crush its national aspirations.

Few railways were built, and they were strategical lines, built for military purposes. All the railways ran toward Vienna and Budapest and no effort was made to bring about intercommunication between the various Serbo-Croat provinces.

When the present state came into existence, the government was confronted with appalling conditions of war damage. The Serbian railways had been destroyed, while the lines on Austrian territory had been worked to death, without repairs of any kind, during five years of war. All the rolling stock had either been destroyed or carried off by the retreating enemy. The country is slowly but surely emerging from the post-war situation.

In the domain of iron, the deposits in Bosnia take the lead. They are among the largest and most valuable in Europe. Beds of iron ore stretch, almost without a break, from Bosanski Novo to Sanski Most. At Bosanski Most they pass under the river and extend into Croatia itself. Ljubija, the only mine which has really modern equipment lies about six miles southwest of Prijedor. From it are raised siderite, carbonate of iron and limonite, or hydrated oxide of iron.

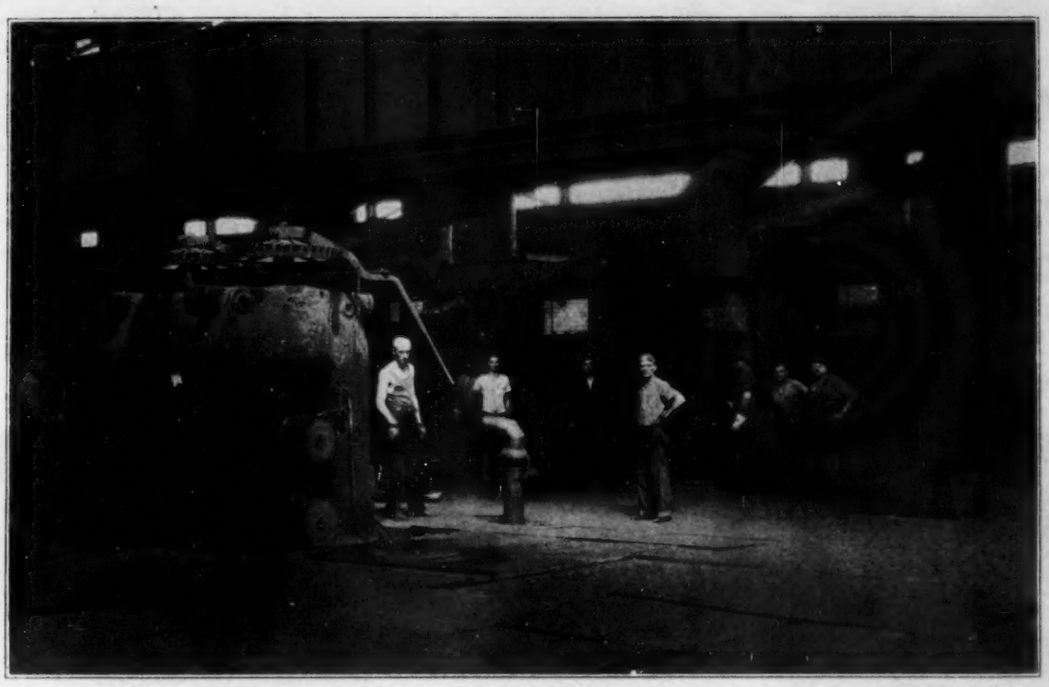
Ore Mined for Centuries

The ore contains 48 to 56 per cent of iron natural and 2 to 4 per cent of manganese, an average of 52 per cent iron and 3 per cent manganese. The iron ore of this district has been worked from the remotest time as proved by the innumerable trenches and galleries which often extend to a great depth below the surface. According to the statements of archaeologists the Romans worked the mines, while later the Saxons left traces of their passage, many of the names of local places being of Saxon origin. The ancients, however, did little more than work the beds of limonite which is easy to smelt. They did not work either the siderite or the hematite. They smelted the ore in specially adapted places called "Majdan," using only hard charcoal in the process. They were able to extract only about 20 per cent of the useful metal. Between 1860 and 1870 there were in the Novi-Ljubija-Sanski Most district more than 100 workings of varying importance; today only their ruins remain. There were still to be seen in 1905 to 1907, at Stara Rijeka, several foundries which had not definitely stopped work. Their output, which was of the highest quality, was sold throughout the Balkan peninsula, especially in Serbia and Turkey, as well as in Austria-Hungary. The iron reached Serbia by river, via the Sava or the Ouna to the Save, and so to Belgrade. The special barges in which the metal was carried were themselves made of iron and were known as "the boats that never return", for on arriving they are broken and sold.

After the Austrians in 1908 had annexed Bosnia-Herzegovina, they began to prospect for lead mines. During the search for these, they discovered the beds of sideros at Ljubija, which are 200 feet thick. In 1912 and 1913 some work was carried on in the mines pointed out by the old miners and the Austrian government decided in 1914 to equip a modern mine at Ljubija and construct, at Baltin Bara, blast furnaces for smelting the ore in the Prijedor district. Electro-metallurgical furnaces were to be worked by a current of 200,000 kilowatts, generated at the station at Vrbas, near Banja Luka. The plans were completed a few weeks before the outbreak of the World war, when they were stopped.

At the present rate of exchange the works at Ljubija, together with the railway are worth over 250,000,000 dinars, about $5,000,000. The total value of the ore desposits in and around Ljubija is estimated at 6,000,000,000 dinars, $120,000,000, but the beds at Ljubija do not represent a tenth of the total deposits in the Novi Sanski-Most basin. The total value of all these beds may be estimated conservatively at 10,000,000,000 gold francs, or $2,000,000,000.

The author is associated with the legation of the Kingdom of the Serbs, Croats and Slovenes, Washington.



Part of the hot mill standing at the Indiana Harbor division of the Youngstown Sheet & Tube Co. The front of the sheet and pair furnaces and the underground and overhead cooling systems are shown in the foreground

Completes Tin Mill Installation

Doubling the Black Plate During the Hot Rolling Process Is Performed Mechanically —Each Tinning Machine Is Equipped with a Magnetic Device for Feeding the Stock Automatically—Description of the Plant

By F. B. Pletcher

ECONOMY of time and effort in output are combined with the utmost in facilities for the comfort and well being of the employes in the new tin plate plant of the Youngstown Sheet & Tube Co., at Indiana Harbor, Ind., just south of the company's pipe and tube works. Finishing touches on the installation are being made, and when the unit is ready for capacity operation it will be capable of turning out 2,500,000 base boxes of finished tin plate, or 115,000 to 120,000 gross tons of tin mill black plate yearly.

In designing and laying out the plant, the company's officials and engineers sought primarily the systematic arrangement of working space that would obviate redoubling of effort. It was the aim to minimize waste motion as to the movement of the raw materials through the stages of fabrication and treatment to the finished product. To this end it was provided that back-traveling would not be permitted. The main buildings of the new unit are built parallel to each other as nearly as possible, all merged by covered passageways. Through each stage of operation, the materials used in production move in a staggered progressive formation on both sides. Wherever possible, the main operations occupy approximately centered points in the parallel buildings and move progressively ahead and sidewise to the warerooms and the loading platform on the extreme south of the unit near the entrance driveway.

Buildings Well Ventilated

Second in importance to the utilization of every inch of space to the best advantage was the problem of a design that would help promote first class workmanship by providing comfortable working conditions for the plant's force of employes. All of the main buildings of the unit have the high and low-bay type roofs, providing for an abundance of sunlight and air. Smoke and dirt are deflected from the windows by the roof construction, regardless of the velocity and direction of the wind.

The 24 hot mills have been installed in units of four, and in a short time the full complement will be in operation. The cold-rolling department is laid for 12 stands of cold mills, 10 of which already are in operation. The cold-rolling department when complete will include four mills of three stands each, built tandem. Each hot mill comprises one pair of 2-high rolls and the latest type of mechanical doubling machine, which attains a maximum speed for the doubling operations.

The tin bars for the hot mill operations are rolled in the company's steelworks at the north, across the New York Central, Baltimore & Ohio and Pennsylvania railroad tracks. Both bessemer and open-hearth bars are used. They are received in standard lengths in the covered bar yard of the tin plate plant, which is 93 x 360 feet. The bar yard is commanded by two overhead roller-bearing cranes of 15 tons capacity each, these cranes running full length of the building. Near the center of this structure is the motor-driven bar shear with its approach table and its hydraulically-

operated bar piler. The bar shear is of the latest type and has sufficient capacity to take care of full operation of the mills at all times.

After the bars are cut to heating size they are placed automatically on the conveyor crate by the bar piler. The crates, which meanwhile are awaiting their load on the conveyor table, each have capacity for 15,000 to 18,000 pounds. The bar piler's plunger descends to the weight level of the crate as the load is being completed. The bar piler is under the push-button control of the bar shear operator. The conveyor table with its loaded crates passes over a scale where the crates are lifted electrically and placed in position for weighing, after which they are picked up by a crane and distributed to the furnace aisle at the charging side of the pair furnaces.

The 24 sheet and pair furnaces are of the continuous type, occupying a space 1104 feet in length. Through the length of the furnace and hot mill building run two overhead cranes of 10 tons capacity each, these cranes having a span of 31½ feet.

Mechanical Charging Employed

The cut bars for the heat are placed on the pusher of the motor-driven charger at each pair furnace, this charger being under direct control of the furnace operators. A limit switch regulates the pusher's length of travel. The furnaces are coal fired, the coal being crushed outside of the building approximately opposite the first of the furnaces before being conducted by skip-hoist to the electrically-driven industrial-type stokers. The motor mounting for these stokers is located under the plunger. The sheet furnaces have independent stokers.

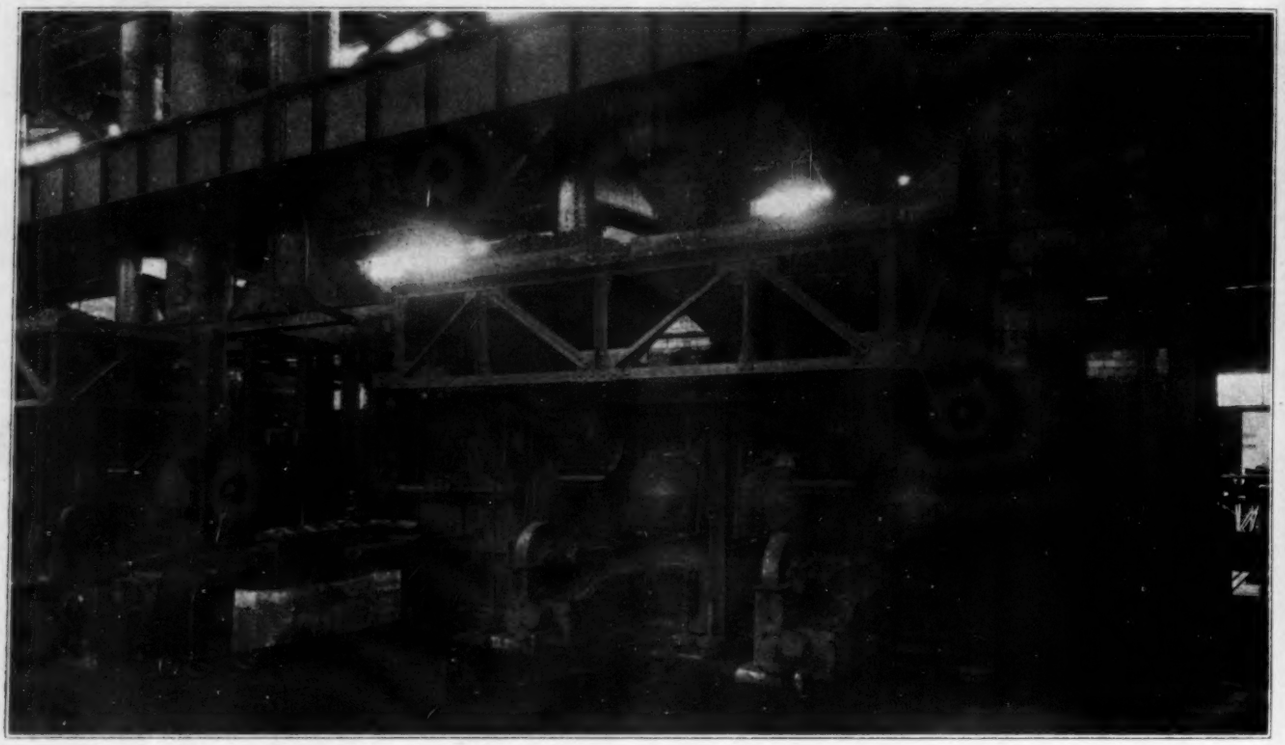
The workmen at the sheet and pair furnaces and hot mills not only are provided with ample floor space in which to work but are protected to the utmost against excessive heat by underground and overhead air coolers. Air is obtained from outside the buildings, and for the underground cooling system the air is forced by blast fans through stand-pipe hoods emerging from the working floor at a little less than waist high. These fans produce a steady current which reaches only the workmen at the furnaces and hot mills. The overhead cooling is by means of forge-type blowers that produce a current at the top of the furnaces through rectangular funnel mouths, acting as deflectors of the hot air from the sheet furnace side. One blast fan takes care of four furnaces. The cooling apparatus is on both sides of the furnaces and between the furnaces and hot mills. The air cooling largely was designed by the company's own engineers.

Serving the 24 hot mills are 30 squaring shears, equipped with the latest safety appliances, for squaring and sizing the black plates, the latter being placed in staggered relation to the hot mills so that no lost motion is entailed in the movement of the product. The hot-mill department occupies a structure 90 x 500 feet.

Tractors Move the Stock

After being sheared and opened, the hot-rolled plates are delivered to the black pickling department, which occupies almost a central group in the adjoining parallel building. In this movement the plates are conveyed by small electric tractors. The black pickling department is equipped with two of the latest and most modern steam-operated pickling machines. Almost parallel to the black pickling machines is the black annealing furnace. This furnace is one of the largest of this type ever built. It is a continuous-type furnace with 10 burners on each side, using coke-oven gas piped from the main works north of the tin plate mill.

The furnace will hold 104 annealing pots and is charged and discharged by the small tractor. In charging, these tractors push the buggies with their loads direct to the charging door. The oven air is preheated for the annealing pots before they reach the burners by the gases drawn by draft from the furnace chamber. The latest type hydraulic pusher or ram handles the trains of 50 to 53 buggies through



Rear side of the sheet and pair furnaces. Tin bars are charged into each pair furnace by electrically-driven charging machines similar in construction to that shown at the left

the entire length of the furnace. At the discharging end of the furnace, cold air is blown over the pots before they reach the outside so that the pots are discharged at a temperature of 1000 to 1200 degrees Fahr.

Still parallel to the hot-mill building and just ahead of the black annealing department is the main machine shop, 70 x 144 feet, equipped with the most efficient machine tools to handle the necessary repair work of the plant. Almost adjacent to the machine shop is the electric substation or tin plate plant power house, equipped to supply power to the motors driving the mills, the overhead cranes and other equipment, and for charging the tractor batteries, as well as for furnishing the light for the plant, yards and auxiliary buildings.

Company Generates Current

The hot mills are driven by 2500-horsepower motors operated on 3-phase, 60-cycle current at 2300 volts. The cold mills are operated by 1000-horsepower motors of similar type, each motor driving five mills at present, but later each will drive six. The generator sets in the plant substation will furnish the 230-volt direct current for the crane motors, the fuel skip hoist, the stokers and pushers, and the hot mills. Alternating current at 440 volts is used for some of the other smaller motors. The latter include the machine-shop drives, drives for the fuel crusher and shear and fan drives. The current is generated at 2300 volts at the main works across the tracks and is conducted at a distributive voltage, partly by overhead wires, to the substation being reduced to 2300 volts and 440 volts. Most of the motors are equipped with roller bearings. The lights throughout the plant are of the Holophane aluminum-covered type.

Just ahead of the hot-mill department to the west are the roll shop and coal handling and crusher apparatus. The roll shop has both lathes and grinders for machining and polishing the mill rolls. The lathes are used only for the rough turning.

After leaving the cold-rolling department, the plates again are placed on the annealing stands for the white annealing oven. The white annealing oven will hold a tonnage equivalent to that of the black annealing oven, but only will take trains carrying a minimum of 88 buggies. The charging and discharging is similar to that of the black annealing. The white annealing furnace also is one of the largest of its type. It is 297 feet long.

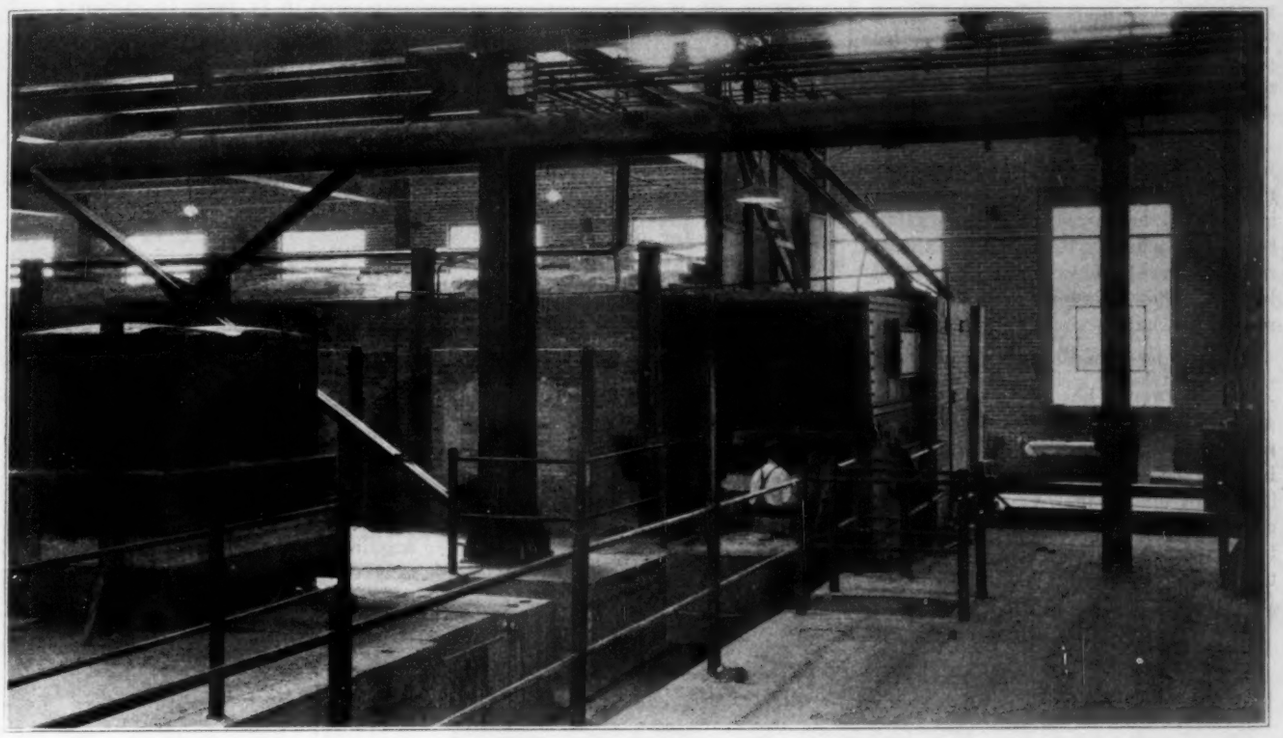
Thence the plate again is taken by tractor to the white pickling machine, transferred to the water boshes and moved by tractor to the tinning machines.

The tin house, approximately 70 x 650 feet in dimensions, contains 20 tinning machines, some of which run three sheets at a time, while others run two, depending upon the gage. Each tinning pot has a magnetic feeding machine, which automatically feeds the plate through the tin bath. Automatic canvas belt conveyors move the plate from the tinning machines to the cleaning machines, whence it is similarly conveyed to the assorting room. Here the plate is assorted by girls in a spacious well-lighted area, the natural light of the room being augmented by artificial daylight. The assorting room parallels the tin house and the white annealing building, as well as the warerooms, shipping rooms and loading platform on the opposite side. All are connected by covered passages.

Directly to the north of the tin house, in staggered relation, is the supply building from which are handled and distributed the pig tin for the tinning pots, the flux and palm oil. Directly ahead of the tin house to the west is the tin house machine shop where all tinning machinery is equipped and repaired for further use. Oil and grease shops are within convenient distance to the various operations.

Handling Facilities Ample

The plant buildings have 20 overhead cranes in operation in the various departments, and is to have 20 to 24 floor operated electric tractors to be used in trains for transporting



Charging end of the large black continuous annealing furnace. The unit holds 104 annealing boxes which are handled by small electric tractors

material and for loading the finished product in cars.

During its installation and pioneer operation, the tin plate plant has obtained its water supply from the main works adjacent, piped overhead part of the way. Similarly steam and gas lines have been conducted from the steelworks plant. The company, however, has been engaged in drilling a well on the tin plate plant acerage which has been sunk to 1700 to 1800 feet in order to obtain the water desirable for its purposes as a part of the plant water system. The water will be circulated through all departments by a pumping station. Water for the drinking fountains will be pumped through a refrigerating system, and will be regulated to 50 to 52 degrees.

The company has a force already at work upon a most attractive and commodious welfare building for the use of the girl employes in the assorting room and offices. It will contain rest rooms, several dining rooms, individual lockers, shower rooms and a large recreation hall.

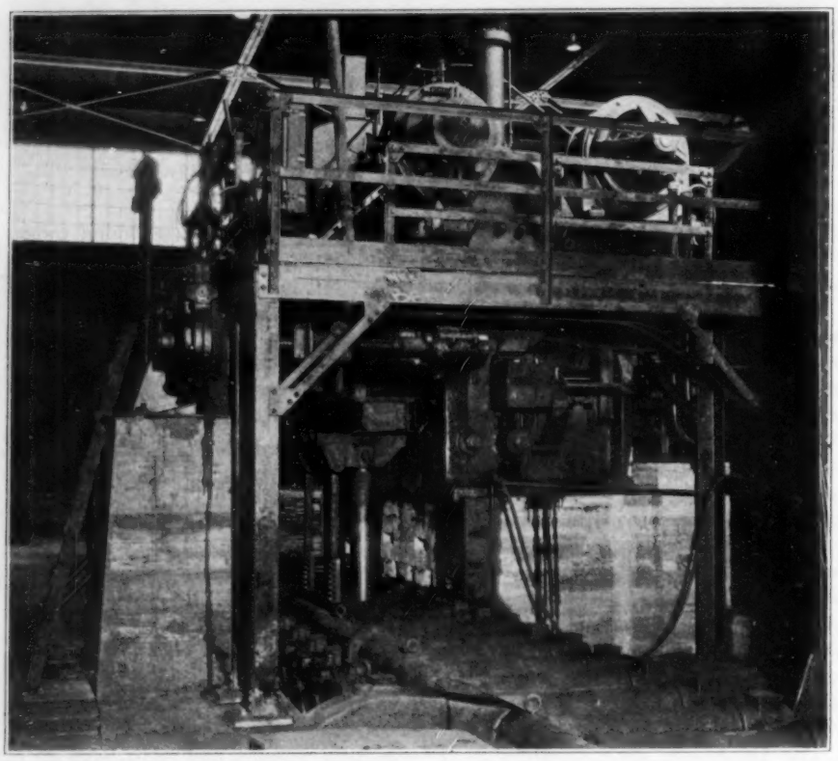
Considers Employes Welfare

An emergency hospital also is being started, at which nurses will be in attendance day and night when the building is completed and the plant is in full operation. Another commodious structure also has been begun to house the lockers and showers of the men employes. This is near the main gate and is convenient for the employes to change clothing upon entering and leaving the works. A waiting room for men and women is being built at the main gate. selves to such treatment. A 2-story office building to be equipped with steel furniture and fireproof vaults will complete the layout. The acreage is sufficient to extend all the main plant structures.

Railroad service is supplied by the Pennsylvania; Indiana Harbor Belt line; Elgin, Joliet & Eastern; and, New York Central railroads. Later water shipping facilities may be developed on the government canal adjoining the grounds. A 30-foot driveway will circle the entire tin plate works.

Makers of Principal Equipment

Hot mills	United Engineering & Foundry Co., Pittsburgh
Cold mills	Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Black pickling machines, Grey type.	
White pickling machines	Mesta Machine Co., Pittsburgh
Mechanical doubling machines	Aetna Foundry & Machine Co., Warren, O.
Squaring shears	Streine Tool & Mfg. Co., New Bremen, O.
Annealing furnaces	American Dressler Tunnel Kilns, Inc., Cleveland
Mechanical stokers	Riley Stoker Corp.
Mechanical furnace chargers	Costello Engineering Co., Pittsburgh
Roll shop lathes	Mesta Machine Co., Pittsburgh
Bar shear	United Engineering & Foundry Co., Pittsburgh
Roll grinding machines	Landis Machine Co., Waynesboro, Pa.
15, 10 and 5-ton cranes	Morgan Engineering Co., Alliance, O.
Hydraulic annealing furnace pusher	R. Dudgeon, Inc., New York
Tinning equipment	Aetna Foundry & Machine Co. Warren, O.
Drives	Fawcus Machine Co., Pittsburgh
Mills motors	Allis-Chalmers Mfg. Co., Milwaukee
Electric control and miscellaneous motors	Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Miscellaneous motors	Reliance Electric & Engineering Co., Cleveland
Crusher motors	General Electric Co., Schenectady, N. Y.
Electric floor trucks	R. & L. Baker Co., Cleveland
Fan equipment	B. F. Sturtevant Co., Boston; Buffalo Forge Co., Buffalo and American Blower Co., Detroit
Scales	Howe Scale Co., Rutland, Vt., and Fairbanks, Morse & Co., Chicago



Shear for cutting standard sheet bars into the desired foot weights. The piling table is shown in the foreground

Elyria Iron & Steel Co. Sales Gain

Sales during the first nine months of the Elyria Iron & Steel Co., Cleveland, were $4,480,000 compared with $3,784,000 for all of 1925 and $2,552,000 for 1924. The company has expanded its operations to plants at Elyria and Toledo this year, having acquired the Superior Metals Products Co. at Elyria and the Standard Steel Tube Co. at Toledo. After all charges, including federal tax allowance, earnings amounted to $471,622. Third quarter sales which included the consolidated statement totaled $1,822,000 and earnings $823,826. Shipments of tubing for the company increased from 18,000,000 feet in 1924 and 28,000,000 feet in 1925 to 34,000,000 feet in the nine months of this year.

Replogle Earns More

Replogle Steel Co. and subsidiaries report for quarter ended Sept. 30, 1926, net profit of $219,098 after depreciation, depletion, federal taxes, etc. This compared with $214,470 in preceding quarter and profit of $226,562 before federal taxes in the third quarter of 1925. Net profit for the nine months of 1926, total $534,049 after depreciation, depletion, federal taxes, etc., against profit of $452,402 before federal taxes in same period of 1925.

Initial determination of physical properties of steel, such as tensile strength, was made in 1829.

Industrial Furnaces

A Treatise on the Design, Construction and Function of Modern Melting, Heating and Treating Units

By Charles Longenecker

Chapter III (Continued)—Intermediate or Heating Furnaces

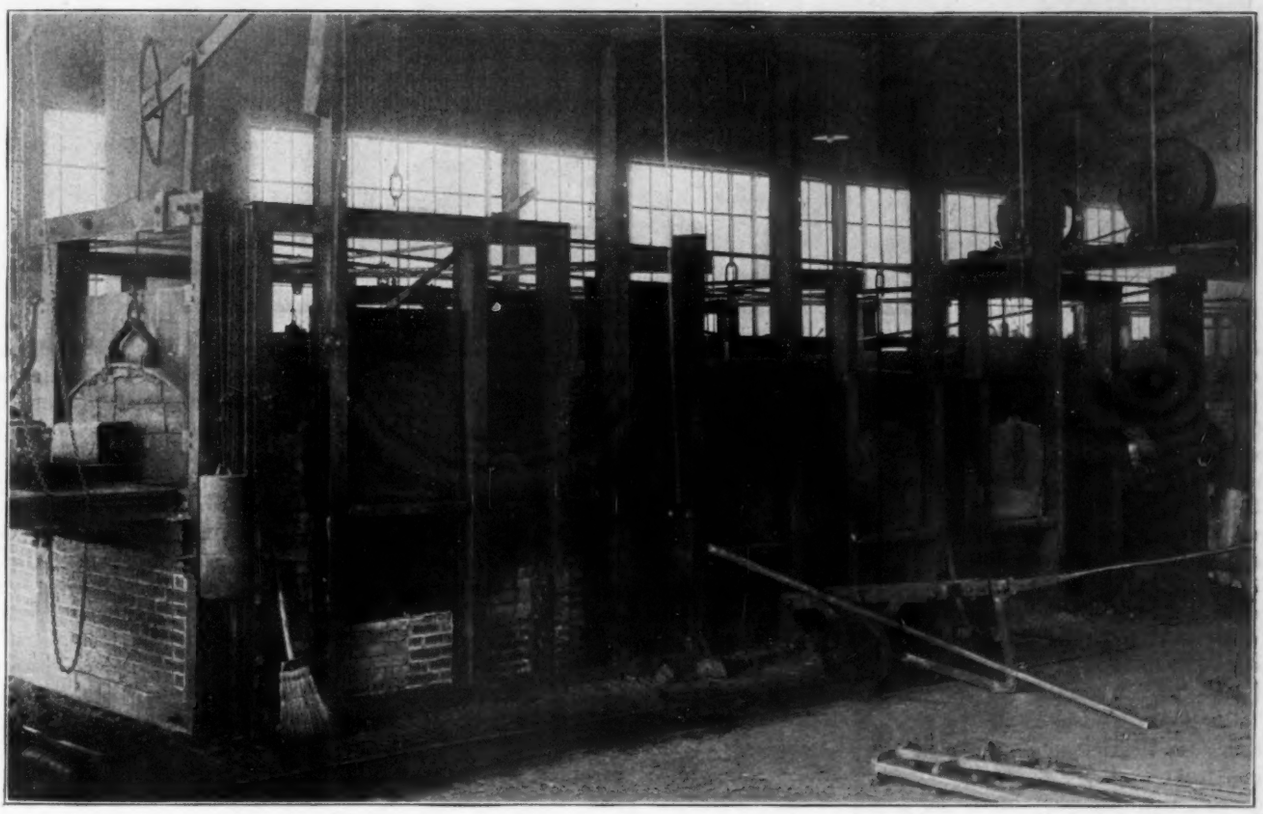
ATTENTION is drawn to the heating of small ingots, not because there is any one type of furnace peculiar to this service, but rather with the desire to cover the heating of all forms of steel. Small ingots in most plants are heated in a different manner from that employed for the larger size. The kind of fuel used also varies.

To effect a division, ingots with a butt dimension of less than 10 inches will be classed as small ingots, but in practice the largest size coming under this heading, is usually 8 inches. Ingots larger than 10 inches must be rolled on a blooming mill while the 8-inch size can be rolled on a bar mill. The justification, therefore, for small ingots is the elimination of the blooming mill and the accompanying heating and roiling cost. Furthermore, on the bar mill the finished product can be rolled direct from the ingot with only one heating.

Ingots Are Bottom Poured

The trend today is to cast only large ingots but for electric and crucible-alloy steels small ingots are, in most cases, a necessity. These ingots usually are bottom poured; by this method many molds can be filled from one central runner and the ingots, so poured, are of a better quality. This step in the process involves considerable care because if the metal is too hot, there is danger of a breakout through the brick or under the mold, while, if the temperature is too low, the steel will not flow readily. In either case the results are disastrous. Another operation in which difficulty frequently is encountered is the stripping of the smaller sizes, especially 4 and 5-inch stock. Any defect in the interior mold surface causes a sticker which means an ingot with a rough skin and the probable loss of the mold.

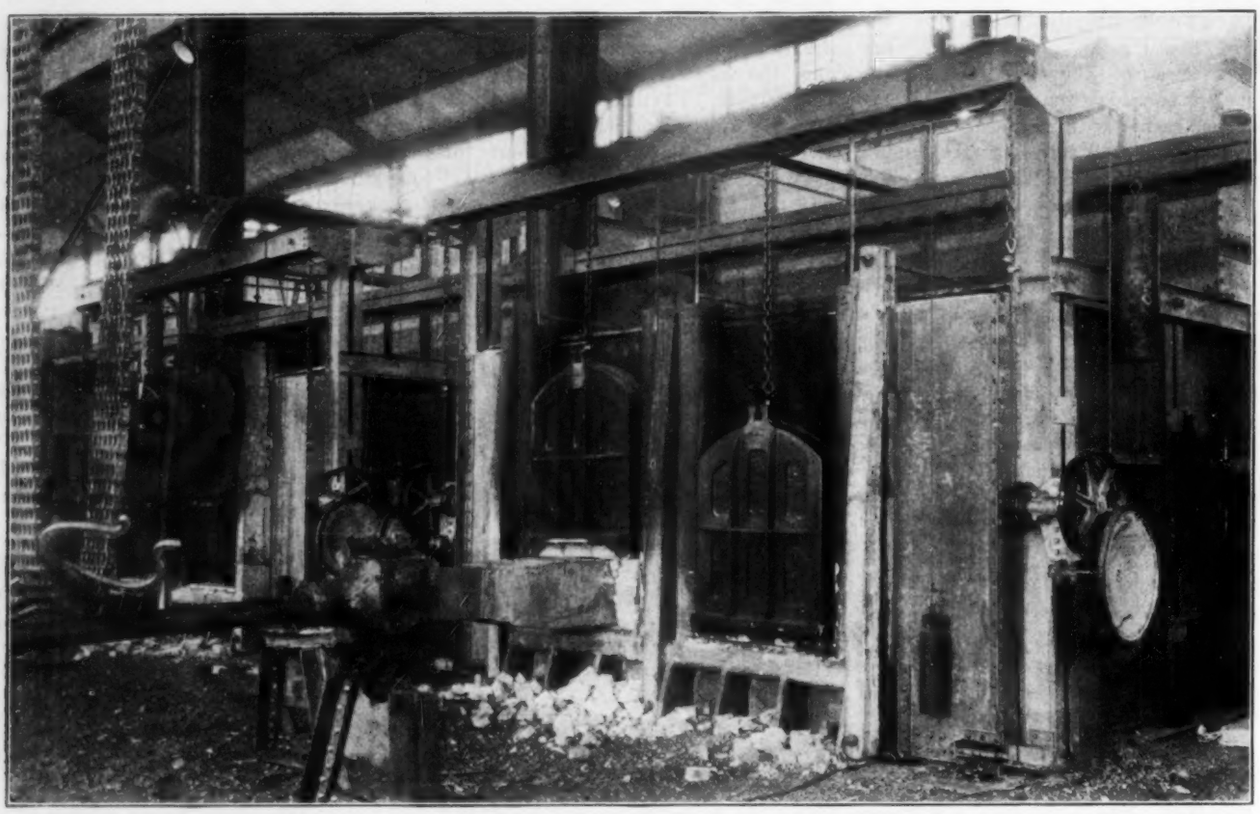
Ingots larger than 8 inches usually are heated in a soaking pit while a reverberatory furnace with a flat hearth or the continuous type with or without recuperators may be em-



COAL-FIRED REHEATING FURNACE OF THE SEMICONTINUOUS TYPE USED FOR REHEATING ELECTRIC STEEL INGOTS

ployed for those of smaller size. With the urgent demand for low costs and quantity production the continuous-hearth furnace is installed by many engineers. The selection of furnace type, however, largely is dependent on the product rolled. Where the mill output varies in size and weight, a continuous furnace is unsuitable. Its installation however, is advisable for the uninterrupted rolling of shapes of the same section and weight. This type of furnace will be discussed in detail later.

Any furnace that will heat billets or piles from 4 to 8 inches square, may be used to heat small ingots. A 25-ton open-hearth furnace recently



TWO-DOOR REHEATING FURNACE OF THE REGENERATIVE TYPE WHICH IS USED FOR REHEATING FORGING INGOTS

was built at an isolated plant in which wrought iron was made exclusively.

The demand for steel in the territory, in which the plant was located, warranted the installation of the steel melting furnace. Ingots, varying from 4 to 8 inches were cast and, on cooling, were charged into the same furnace as employed for heating piles. No difficulty was experienced in heating the ingots but the waste-heat boiler on the furnace, generated much less steam than when piles were heated.

Engineers in designing forge furnaces for heating ingots have run the gamut from the elementary box-type construction to the more advanced reverberatory form, and then, to the regenerative system with more complex features. The box-type furnace is found in many of the large plants; its design is simple. Another unit which meets the approval of many engineers, is the reverberatory furnace fired by hand, by stoker, or with oil or powdered coal. The furnace usually is equipped with one to three doors. The most complex forms of forge furnaces, such as the recuperative and regenerative types, are employed to a much lesser extent. In a few plants soaking pits are used to heat ingots intended for forging.

The function of all forge furnaces is to heat the steel or iron to a temperature sufficiently high to allow the metal to flow freely when struck by the hammer or when pressed. This statement expresses in concise terms, the purpose of the furnace.

Heating Requires Care

Proper heating of metal, however, requires considerable skill. Any piece of steel can be injured by improper heating. Steel intended for forgings, has a critical temperature above which it must be heated. But, when this temperature is exceeded a growth in the grain structure occurs. If heated too high the grain structure will be destroyed. Good practice is to bring the steel to a temperature somewhat above its critical point, forge it until the critical temperature is reached and then reheat the piece for further processing.

Heating the metal to the top limit with the intent of obtaining a large reduction in the ingot before it is too cool for forging is objectionable, because not only is the grain structure jeopardized but there is a likelihood that severe strains may be set up. It is apparent, therefore, that an upper limit in temperature exists, above which the steel should not be heated. This upper limit depends on the content of carbon and other elements in the steel. It may be 2600 degrees, Fahr. for the common grades of steel and 2000 degrees for high-carbon steel. Nickel-chromium and chromium-vanadium steels should not be heated higher than 2100 degrees. The temperature at which forging is finished controls the grain refinement.

Not only must extreme care be exercised in heating the ingot to the correct temperature but the rate of heating also must be controlled. So important are these two features that failure in either case will impair the metal to such an extent as to render the finished forging worthless. Subsequent heat treatment cannot restore the grain structure. Low-carbon steels can be heated more rapidly than those with a high-carbon content, or those containing alloys. Within reasonable limits, slow heating is more advantageous than rapid heat-

ing if the quality is to be retained.

The third factor in heating metal to be forged is that the piece be thoroughly heated throughout its cross-section. The center must be as hot as the outer surface. This means the ingot must be subjected to a soaking period of such duration for the heat to penetrate the mass and bring all parts to the same temperature.

From the foregoing considerations, it is apparent that furnace volume plays an important role in correct furnace design. Sufficient volume must be available after the ingot is placed in the furnace, to allow the fuel to burn efficiently, and in sufficient quantity to generate the requisite amount of heat. What this volume should be and how it should be proportioned, can be determined best by experience. Enough space should be provided around or between the ingot or ingots, so that the hot gases can circulate readily and give up their heat.

In many type furnaces the tendency to limit the space above the ingot, where combustion must be completed, and also on the sides; while frequently, the gas flow beneath the ingot, which should be supported some inches above the hearth, is too restricted. Too much space, however, encroaches on economic construction and efficiency, but this limit rarely is reached. Sufficient volume assures not only the most thorough combustion, but also greatly improved heating due to the steel absorbing a greater proportion of the radiant heat from the high-temperature gases.

Construction Differs

After the cubical content of the furnace is determined provision must be made for the generation and application of an amount of heat sufficient for the purpose. The combustion of the fuel, which supplies this heat, can be effected in either one of two types of furnace construction. In one type the fuel is burned in a combustion chamber, the hot gases flowing into an adjacent chamber containing the material to be heated. In the second type the fuel, oil, gas, or powdered coal is burned in the chamber which contains the steel and, naturally, combustion takes place in close proximity to the metal. The former type, with a combustion chamber, usually is recommended but so many factors are to be considered, other than those relating to fuel consumption, that a choice of design can not always be made with increased fuel economy as the sole objective.

A decided advantage can be claimed for the furnace with a separate combustion chamber in that the fuel while burning, is surrounded by hot walls which condition does not exist in furnaces of one chamber. In the latter construction, the cold steel surfaces hinder ignition and retard combustion. Other inimical features of the one-chamber type, are the likelihood of localized heating and the probability of cutting the surface of the ingot. Ample combustion space and high burners tend to obviate these difficulties. In the recuperative and regenerative types both efficiency and heating conditions, as a rule are superior to the box or the simple reverberatory units because of the fuel savings.

GAS-FIRED FURNACE, WITH FIVE CHARGING DOORS USED FOR PREHEATING SMALL CRUCIBLE STEEL INGOTS

Fuel consumptions, hearth areas and other features covering the practical side of the operation of forging furnaces, are extremely divergent in quantity and dimension. This is necessarily the case as the material heated also varies within wide limits in size, weight and composition. In the forging industry, fuel oil is burned more extensively than any other fuel. The reason for this popularity is the ease with which it can be handled and applied. But, as is frequently the case, an apparent advantage may be offset by some less obvious disadvantage which, in this particular instance, is

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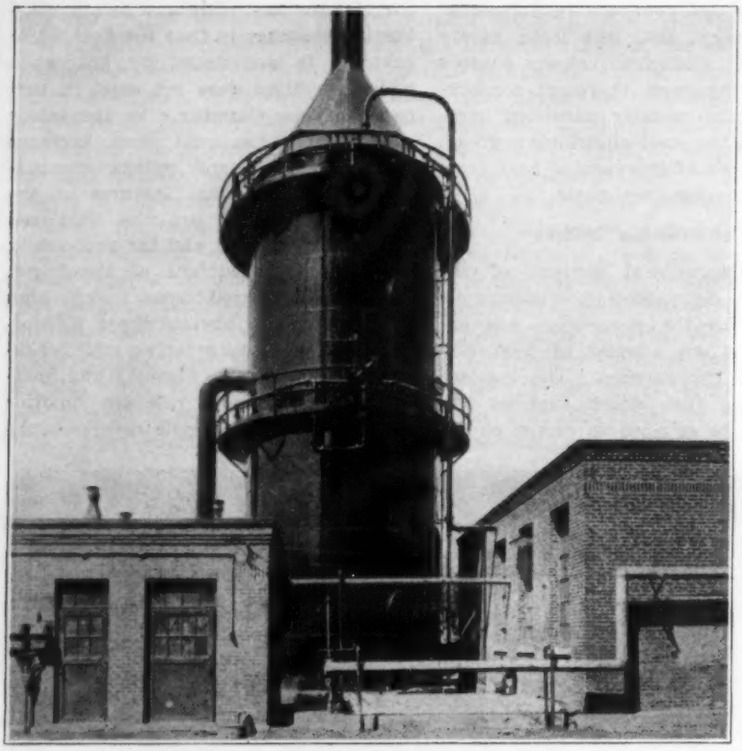

Fig. 1—Liquid purification equipment installed for the Allentown-Bethlehem Gas Co., Bethlehem, Pa. Capacity 10,000,000 cubic feet per day

Gas Purification Increases Output of Open-Hearth Furnaces

By F. W. Sperr, Jr.

THIS is an abstract of an article of the same title which appeared on pages 1046 and 1047 of the Oct. 21, 1926 issue. It gives corrected figures on purification costs for the Seaboard process and contains additional information for those interested in the purification of open-hearth gas.

THE value to the steel industry of the removal of sulphur from open hearth fuel gas is important. One of the earliest liquid purification plants furnished by the Koppers Co., Pittsburgh, was for the use of the Crucible Steel Co. of America, in purifying coke oven gas used in open-hearth furnaces at Midland, Pa. This plant has been in operation for nearly three years and the results have been so satisfactory as to warrant the conviction that the purification of all coke oven gas for open hearth fuel is entirely feasible and economical.

In artificial gas, the bulk of the sulphur occurs as hydrogen sulphide. In addition to this there is always some organic sulphur, principally carbon disulphide. In coke oven gas such as would be produced from Pittsburgh coal, the organic sulphur should not exceed 3 per cent of the total sulphur.

The first liquid purification process

Operating Data on Liquid Purification Plant

Purification of Open-Hearth Fuel Gas

YEAR 1924

	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
H_2S Inlet	543	464	489	419	415	400	409	485	528	566	510
H_2S Outlet	166	101	71	53	47.5	71	126	99	113	114	109
% Removal	69.5	78.2	85.5	87.3	88.6	82.3	69.2	79.6	78.6	79.9	78.6
% Alkalinity	3.51	4.02	3.33	3.71	5.08	4.46	3.01	3.16	2.73	2.51	2.09
M Cu. ft. Gas	275381	268612	160182	167390	163647	253285	323178	339574	346055	326610	363221
Lb. Soda Ash	18300	12600	8700	7500	300	300	17100	15900	10800	11700	12600
Lb. Soda Ash M cu. ft. Gas	.0665	.047	.054	.045	.0018	.0012	053	.047	.0312	.0358	.0347
Lb. H_2S Removed	148200	139200	95700	87500	85800	119000	130700	187800	205000	211000	208200
Lb. H_2S / Lb. Soda Ash	8.1	11.05	11.00	11.68	2.86	3.97	7.65	11.80	19.00	18.05	16.53

YEAR 1925

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
H_2S Iqlet	509	522	537	503	504	483	492	494	463	511	548	532
H_2S Outlet	104	114	109	99	105	104	111	107	99	102	113	105
% Removal	79.5	78.1	79.7	80.5	79.2	78.5	77.6	78.3	78.6	80.2	79.4	80.3
% Alkalinity	2.59	2.83	2.43	2.07	1.77	2.46	2.69	2.55	2.71	2.78	3.22	2.94
M Cu. ft. Gas	370594	339477	374581	350770	364782	373106	389003	399499	373126	384697	394728	440479
Lb. Soda Ash	6900	9900	10800	6600	15300	19200	17580	23100	21934	18300	16600	12900
Lb. Soda Ash M Cu. ft. Gas	.0186	.0292	.0289	.0264	.0420	.0515	.0450	0580	.0590	.0476	.0421	0293
Lb. H_2S Removed	213000	198000	229000	203000	208000	202000	201000	221000	194000	225000	245000	269000
Lb. H_2S / Lb. Soda Ash	30.8	20.0	21.2	30.8	13.6	10.52	11.45	9.57	8.85	12.3	14.75	20.8

which was put into commercial operation by the Koppers Co. was developed with the idea of removing the bulk of the hydrogen sulphide by simple and inexpensive means so that the sulphur content of the gas would be reduced to a uniformly minute amount which would be extracted in the ordinary oxide boxes. This process, which has been called the Seaboard process, is the one in use at the Crucible Steel company's plant at Midland, except that the allowable sulphur for the open-hearth furnaces is not so low as to require the refinement in purification which additional oxide boxes would give.

The Seaboard process consists essentially in scrubbing the gas to be purified with a dilute solution of sodium carbonate. By this means 85 to 95 per cent of the hydrogen sulphide and hydrocyanic acid is removed. This solution is subsequently revivified by aeration. The air used in this stage, containing the hydrogen sulphide, is discharged into the atmosphere through a high stack or is employed in any combustion process available.

Fig. 2 shows the apparatus usually installed for operation of the Seaboard process. It consists of a tower having two main sections designated as the absorber and the actifier, together with air blowers, circulating pumps, and other minor auxiliary apparatus. The absorber and actifier are filled with coke, spiral tile, or wooden hurdles. Extraction of additional amounts of hydrogen sulphide and hydrocyanic acid may be effected by a further scrubbing operation, but a single scrubbing is ample for any steelworks purposes. In most gas plants the small amount of hydrogen sulphide remaining is removed in iron oxide catch boxes.

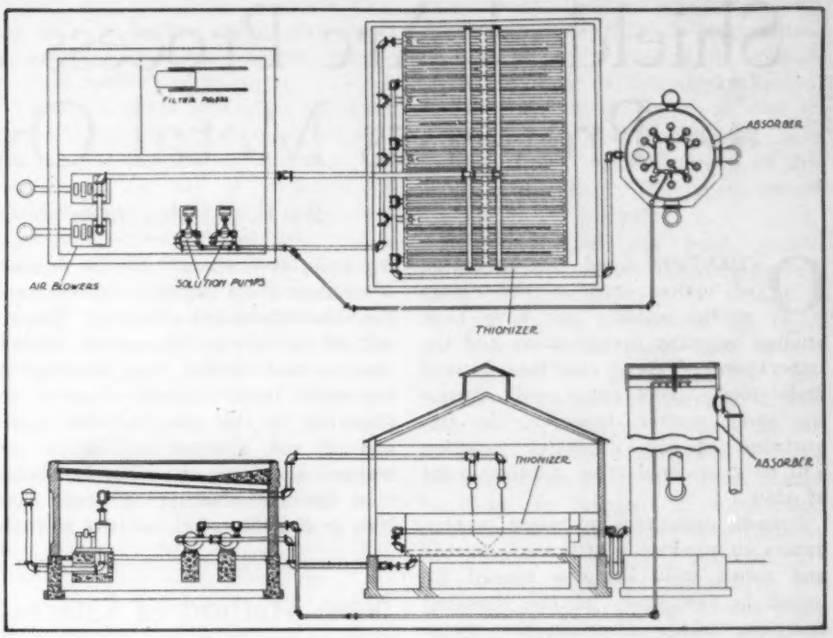

FIG. 3—ELEVATION AND PLAN VIEW OF APPARATUS FOR GAS PURIFICATION BY THE SULPHUR RECOVERY PROCESS

Reference to the accompanying table gives an idea of the quantities of materials involved, the gas treated and the percentage removal of hydrogen sulphide which has been considered sufficient for steelworks purposes.

The operating cost of the plant for which the accompanying table has been compiled is 0.2c per thousand cubic feet of gas treated. The cost of liquid purification at the plant of the Seaboard By-Product Coke Co., Jersey City, where higher percentage removal is necessary, has been 0.34c per thousand cubic feet. For ordinary steelworks purposes it is believed that the operating costs should not exceed 0.25c per thousand cubic feet of gas purified and that the total cost, including depreciation and other fixed charges, should not exceed 0.5c per thousand cubic feet of gas.

The application of the Seaboard process to open-hearth requirements has already been successfully demonstrated by nearly three years of operation of the Crucible Steel Co.'s plant at Midland, which has a capacity to treat approximately twelve million cubic feet of coke oven gas per 24 hours.

Prior to the installation of the gas purification equipment, it had been found impossible to use coke oven gas exclusively in any of the open-hearth furnaces of the Crucible Steel company. The high precentage of sulphur made it undesirable to use this gas either for melting down or for the end of the heat. The use of coke oven gas during only a part of the open-hearth furnace cycle resulted not only in poor operation but in poor utilization of the gas. The purified gas, on the other hand, can be used very satisfactorily through an entire cycle with a complete absence of sulphur trouble in the furnaces.

Although the hydrogen sulphide discharged to the atmosphere in this process is highly diluted, under certain circumstances its characteristic disagreeable odor can be detected and may prove to be objectionable. In

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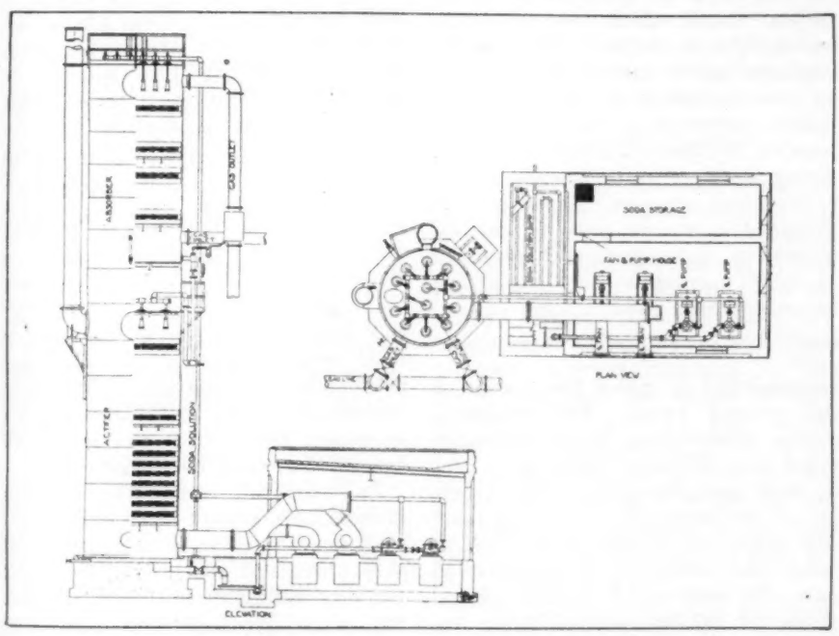


FIG. 2—ELEVATION AND PLAN VIEW OF APPARATUS FOR THE LIQUID PURIFICATION OF OPEN-HEARTH GAS BY THE SEABOARD PROCESS

Shielded Arc Process of Welding Prevents Metal Oxidation

By P. P. Alexander

OXIDATION and nitrogenation of molten iron in the crater of the welding arc have been studied by many investigators and the importance of these reactions is well understood. This paper will discuss the same matter, however, the importance of the oxidation reaction will be considered from another point of view.

Present endeavors by many investigators to produce a still more ductile and sound weld bring a special interest in the study of the chemical reactions taking place in the crater of the arc. We know from analysis of the arc deposited metal that oxygen and nitrogen combine directly or through some intermediate stages with the molten iron. The deleterious influence of oxides and nitrides is well known and need not be discussed. The question of interest is what influence the oxidation reaction exercises on the porosity of the weld; in other words, what is the relation of the oxidation of the surface of the crater to the number of gas pockets in the solidifying metal?

The molten steel in the crater of the arc absorbs large amounts of the gases surrounding the arc, all gases being soluble in molten steel to a certain degree. Hydrogen and carbon monoxide probably are the most soluble ones. It is understood that the solubility of gases in molten metal is a function of their molecular weight and should be decreasing with their density. Yet, direct observations fail to show great distinction even between gases of such widely different densities as argon and helium.

Solubility Function of Temperature

It may be inferred that in the practical applications of welding all gases may be considered as soluble to a great extent. Solubility of the gases in the steel, copper and other metals used in welding is a function of the temperature. At the boiling point, metals practically are free from dissolved gases. Then as the temperature of the metal drops down the solubility at first rapidly increases to a maximum, somewhere half way between the boiling and melting points of the metal considered. Further drop in temperature is followed by a slight decrease in solubility until the freezing point is reached. At the moment of change from liquid to solid state, the solubility drops abruptly. The result of this abrupt change in solubilities is that during the freezing of the metal large volumes of gases are liberated in the mass of the metal and if not allowed to escape are trapped and form numerous blowholes.

In the manufacture of steel castings or crucible steel, various methods are employed to insure free escape of the evolved gases. The conditions during solidification of arc deposited metal are different from those met in steel manufacturing. The freezing of arc deposited metal is so rapid that unless the freezing is retarded to insure the escape of the precipitated gases the weld metal will be porous. When the welding is done in air, the molten metal in the arc crater absorbs large volumes of nitrogen from the air which is expelled during the solidification of the metal. It is this efficient mechanism of evolution of the precipitated gas which deserves a careful study. To reveal the mechanism of the gas evolution, a series of experiments were conducted on the deposition of the metal in oxidizing, neutral and reducing atmospheres.

The first close examinations of large craters of powerful welding arcs burning in air showed that the metal is boiling near the foot of the arc core. Outside of that region there is a concentric belt in which the molten metal is comparatively quiet. But the cooler parts of the crater and especially the regions next to the solidifying edge of the molten pool are in a state of continuous agitation. A large number of small gas bubbles are continually rising and escaping from the surface of the molten metal. At the same time an iron oxide continually forming on the surface of the molten metal floats like a layer of slag. Of course, part of that oxide goes into solution as FeO. The rest of the oxide left on the surface is further oxidized during the solidification of the metal and forms a layer of ferroso ferric oxide.

Welding Atmosphere Is Varied

The oxidation reaction is a source of large amounts of additional heat. One gram of iron when oxidized to form Fe_2O_4 will produce 1616 calories of heat. Calculations show that if this amount of heat be absorbed by the thin top layer of the cooling metal, the temperature of that layer will be raised by several hundred degrees. In other words, the amount of heat produced by the oxidation of the top layer of the molten iron is sufficient to retard the freezing of this layer and keep the surface in the molten state until the rest of the weld has passed into the solid state. This free surface allows all the evolving gases to escape freely from the weld and leave it free from blowholes.

To verify this assumption, a series of experiments were made on the deposition of metal in an atmosphere of pure argon and the mixtures of that gas with different amounts of oxygen. The welds produced with pure iron electrodes in pure argon are quite porous. Half of one per cent of oxy-

New Method of Interest

EARLY this year the General Electric Co. announced that its research engineers had developed a new process of electric arc welding, either carbon or metallic, in which the arc is protected from atmospheric oxygen by a screen of some gaseous media. Not a great deal of information on the new method has been published, consequently, this article prepared from a paper presented at the fall meeting of the American Welding society at Buffalo, Nov. 16-19, by P. P. Alexander, research engineer, General Electric Co., Lynn, Mass., should prove of considerable interest. The author points out the theory of weld solidification and the evolution of gases and shows how the absorbtion of these gases by the molten metal affects the structure and quality of the weld. Experiments conducted on the subject disclosed that by proper regulation of the atmosphere surrounding the weld it is possible to control oxidation of the fusing metal so as to provide a weld of required physical properties. Although the process still is in the laboratory state, equipment soon will be on the market to make the method of commercial value.

gen added to argon is noticeable by a slight oxidation of the surface of the weld. When the amount of oxygen is increased to form 6 per cent of the atmosphere surrounding the arc, the oxidation of the surface of the crater is quite pronounced and the weld is more or less free from blowholes. Twenty per cent of oxygen gives conditions identical to those observed when welding is done in air and the deposited metal is entirely free from blowholes.

Observations of the craters of arcs maintained in other gases are quite in accord with the above statements and lead to the conclusion that oxidation of the surface of the arc crater is the determining factor in the free escape of the evolved gases. It is oxygen which is responsible for the sound welds produced in air. Of course, this freedom from gas pockets is obtained at a cost of a high oxidation of the deposited metal which makes it unsound in other respects.

When it is desired to produce a weld of high ductility, oxygen must be kept away from the crater either by protecting its surface with an exceptionally heavy layer of fluxes or by surrounding the arc with hydrogen or other suitable gaseous media. As the top layer is no longer the seat of production of additional heat, it sometimes solidifies simultaneously with the rest of the deposited metal with the result that a part of the evolving gases is trapped. From the foregoing statement it can be seen that as long as we desire to prevent oxidation of the weld we are confronted with the problem of the free escape of the gases.

As already has been stated, it may be inferred that in practical work on arc welding all gases can be considered as very soluble. Therefore, the problem of production of nonporous welds consists in the efficient method of expulsion of the evolving gases. As has been shown above, this is being taken care of by the oxidation reaction when the welding is done in air. In the more careful methods of welding in reducing and neutral atmospheres or when the crater is fully protected by a heavy layer of fluxes, other means should be provided to retard the solidification of the surface layer.

In the atomic hydrogen process the oxidation reaction is replaced by the recombination of the atomic hydrogen into the molecular state. In that process the adopted technic is such that the solidifying edge of the molten pool is continually swept by the atomic hydrogen blown off the arc. When the atomic hydrogen comes in contact with the iron it recombines into the molecular state, therefore, replaces the oxidation reaction present in other methods of welding.

The shielded arc process as has been mentioned previously is used for carbon arc and metallic arc welding. In both cases the arc is protected or shielded from atmospheric oxygen by a gaseous screen of hydrogen, water gas or other gaseous media. Here the oxidation reaction is entirely suppressed but the solidification of the surface layer may be retarded by direct radiations from the arc, careful control of the speed of travel and motion of the tip of the electrode. While apparatus for practicing the shielded arc process is not yet upon the market, this process soon will find its place of usefulness alongside other welding processes in the practical fields of application.

Industrial Furnaces for Heating Ingots

(*Concluded from Page* 1357)

the waste of fuel where burner regulation is not supervised carefully.

As measured in pounds of steel heated, per gallon of oil consumed, the lower limit will approximate 20 pounds while the top limit rarely exceeds 70 pounds. In a certain plant where ingots 55 inches diameter are heated 36 to 45 pounds of steel were heated per gallon of oil. The furnace is of the conventional box-type design. Sixty to 70 hours are required to bring the ingot to the forging temperature. A second plant employing both the simple reverberatory and regenerative types heat 33 pounds of steel in the former and 55 pounds in the latter, per gallon of oil. Ingots 60 inches diameter are ready to forge in 78 hours.

How Furnace Functions

Satisfactory results are being secured in a simple type of furnace constructed with twin heating chambers. In practice, ingots are charged in both chambers but in only one are the burners lighted. The hot gases flow from the chamber of highest temperature, through passages in the center wall, into the second chamber in which they give up heat to the ingot. By this procedure a considerable portion of the heat in the hot gases, which otherwise would be lost, is conserved. A furnace of this type will heat 40 to 50 pounds of steel per gallon of oil burned.

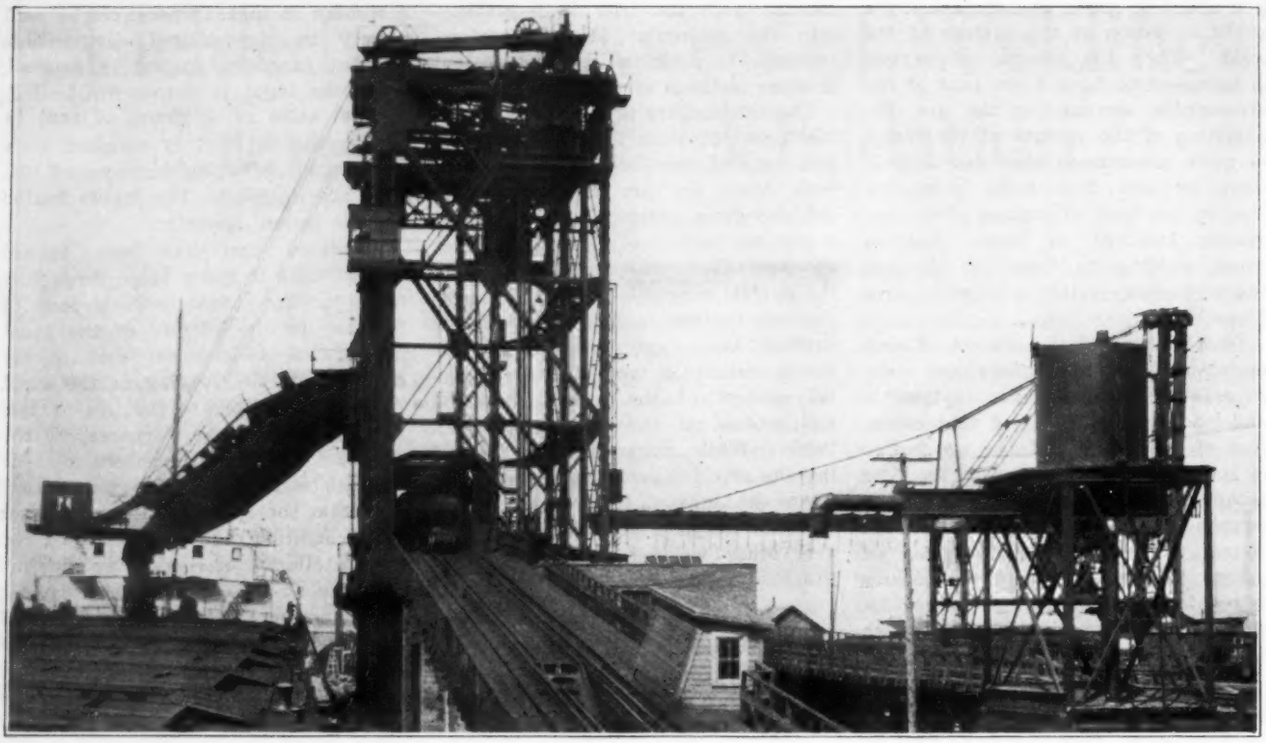
When carefully operated the plain, hand-fired, reverberatory furnace heats in an acceptable manner. The atmosphere in these furnaces can be held closely to the desired composition, so that excessive scaling is avoided, while the ingot is thoroughly heated. A fuel ratio of 1 pound of coal to 4.4 pounds of steel is obtained in a small plant in which furnaces of this type are installed. The ingots heated are 30 inches diameter.

Powdered coal has been burned economically in many large forge furnaces but unfortunately the deposit of fine ash on the surface of the ingot has proved a detriment both to the heating and the forging of the steel. Another drawback to the use of this fuel in large forge furnaces, is the pollution of the atmosphere by the fine ash suspended in the gases escaping from the furnace. In some cases this condition can be remedied by the installation of hoods over the furnace doors but this method is not effective where a portion of the ingot projects through the door and the opening is bricked. Openings in the brickwork allow the escape of the gases laden with dust. On the other hand the flame of the burning coal is intensely radiant, which is a most desirable feature because it insures favorable heating conditions and thoroughly heated metal.

Waste-heat boilers have proved an economical adjunct in plants where furnace operation is continuous. Where such operation is not continuous the initial cost of installation, maintenance cost, etc., is liable to make the addition of boilers a burden rather than an asset. In a majority of plants one waste-heat boiler is served by two furnaces. Seldom is the capacity of such boilers above normal. In forge shops where soaking pits have been used to heat ingots for the press or hammer, a fuel consumption of 22 gallons of oil to a ton of steel is obtained.

Discusses Spring Design

A 36-page booklet intended as a guide book for the user and designer of springs is being distributed by the Wickwire Spencer Steel Co., New York. In the first few pages interesting data are presented on compression and extension springs; and torsion, motor and clock, automobile, scroll, flat, and agricultural springs. Certain differences in the design of a spring, which lead to inaccuracies, are discussed at length; numerous formulae and drawings are included. The last section is devoted to the theory of error calculations and its application to the helical spring formula for round wire; and, the practical use of the variation formula.



General view of 120-ton lifting car dumper designed and built by the Wellman-Seaver-Morgan Co. for the New York Central's Toledo docks

Operating Economy of New Car Dumper Reflects Simplicity of Control

By A. F. Case

FOR many years the lifting car dumper has been the accepted method of loading coal boats from railroad cars, especially in the coal trade of the Great Lakes. The first dumpers of this type were designed to handle cars of 30 to 50 tons capacity and, by gradual stages, they have increased in size until the present demand is for dumpers capable of handling cars having a load capacity of 120 tons of coal with a tare weight of 80,000 pounds.

While electrical operation of car dumpers of other types has developed to a high degree, it is only recently that the adherence to steam operation of direct loading lifting dumpers has wavered and full electric operation has been adopted.

The first electric lifting car dumper of this type was installed at Baltimore in 1920 and the next installation was in the present year 1926 at Toledo, O., on the docks of the New York Central Railway Co., Ohio Central lines. It also was designed and built by the Wellman-Seaver-Morgan Co., Cleveland.

This Toledo car dumper is designed to handle all sizes of open top railroad cars ranging in size from the smallest to the largest of 120-ton capacity, at a rate of 40 cars per hour, It was placed in operation about April 1 and about 2¼ million tons of coal were handled by Aug. 1.

Essentially the car dumper consists of a main supporting structure carrying a lifting cradle, a pan girder, an adjustable pan into which the coal is dumped from the railroad car; a telescope chute at the outer end of the pan, through which the coal passes from the pan into the hold of ship; the machinery units for the different operations, and the sub-station units.

The main structure is located adjacent to the dock face with the pan overhanging the boat. The pan is hinged to the pan girder which is capable of vertical adjustment in height to accommodate different heights of boats. The inner end of the pan is wide enough to receive coal dumped from the longest cars, but is contracted to a narrow outlet at the discharge end where a telescopic chute is attached.

The car tracks in the cradle are elevated about 25 feet above the dock and cars are entered into the dumper by means of a mule which is operated by a haulage cable and pushes the cars up a 12 per cent approach grade leading from the dock level to the elevated position of the cradle.

After the car has been dumped it is bumped out of the cradle by the next loaded car after which it travels by gravity down an inclined run off track to a kick-back and thence, still by gravity, down inclined tracks into the storage yard for empty cars.

The main structure of the machine is approximately 108 feet high, and the plate rails are 25 feet above the foundation. The pan is approximately 64 feet long at the inner end and contracts to about 5 feet at the discharge end.

Departing from previous construction the pan girder is designed to travel on the front face of the front

The author is manager of the ore and coal division of the Wellman-Seaver-Morgan Co., Cleveland.

column, the adjusting screws are carried on brackets on the face of these columns where any danger of damage from car interference is eliminated.

Another feature is the over counterbalancing of the cradle. This has the effect of greatly reducing the power required for the cradle operation and effectively reducing the peak load. Pivoted counterweights on the cradle are used to hold the car while dumping. The clamps consist of heavy cast steel beams supported by large hook castings which travel in guides on the back of the cradle. The dumping face of the cradle is entirely free of obstruction resulting in free flow of coal. The guides being on the back of the cradle are not clogged with material, and can be kept well lubricated.

The counterweights are attached to pivoted arms which hold the clamps up when the cradle is seated. As the cradle is lifted from its seat the clamps descend to the top of the car where they rest until the cradle has rotated about 50 degrees. At this point the counterweight arms automatically connect with the clamping cables holding the car while dumping and until the empty car has returned to the 50-degree point when they release the clamp cables. As the cradle approaches the initial position the counterweights are deflected by inclined guides and release the clamps.

Due to the extreme accuracy of electric control and the introduction of automatic features, only two operators are required.

The mule haulage is equipped with limit switches providing acceleration, slow-down, stop, etc., so that operation is automatic, requiring no attention of the operator, although the control is so arranged that the operator can control it manually.

The action of the cradle hoist throughout the dumping and righting cycle is automatic and is made operative with the pan girder in any position by a differential gear device.

The hoisting mechanism for operating the cradle consists of two heavy cast steel drums, the axes of which are at right angles to the face of the dock. Ropes from each drum lead to the opposite ends of the machine. The counterweight ropes are attached to the drums opposite to the hoist ropes and unwind as the cradle is hoisted, the counterweights assisting the motors in revolving the drums, thus reducing the peak load.

The cradle hoist motors are 450 horsepower each and are driven by separate direct current generators. These motors are controlled by adjustment of the generator fields by magnetic controllers operated from the cab by a small master switch.

The mule haulage rope is wound on a drum geared through a flexible coupling to a 450 horsepower direct current motor. The mule haulage motors are driven by separate direct current generators in the same manner as the cradle hoist motors.

The pan hoist mechanism consists of a drum geared by two reductions of spur gearing to a 295-horsepower motor with rheostatic control.

All of these mechanisms are amply provided with service and emergency brakes. The other motor equipment includes one 105-horsepower motor for the screw, two 45-horsepower units for the chute and one 13-horsepower motor for the gates.

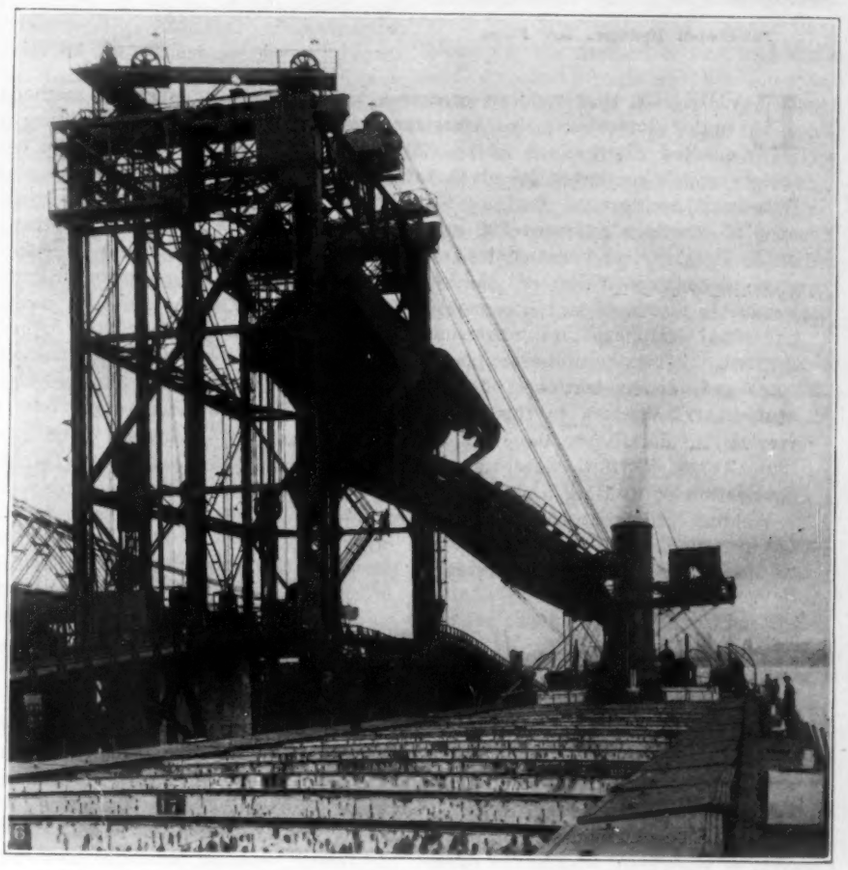
The substation equipment includes three identical generating units with the alternating current and direct current switchboards, meters, etc.

Each power unit consists of two 375-kilowatt 250-volt, direct current generators direct connected to a single 1100 K. V. A. synchronous motor operated on 6600 volt, 3 phase 60 cycle current. One of these units is used for operating the cradle hoist and one for the mule haulage. One of the generators of the third set is used for motor field excitation for the synchronous and direct current motors as well as for the operation of the direct current auxiliaries. The second generator is a spare which can be connected in series with the exciter, to supply power at 500 volts.

The control of the cradle hoist and the mule haulage are identical in principle and is the well known Ward-Leonard system. The two cradle hoist motors, for instance, have their armatures electrically tied together by a loop circuit of heavy copper. This loop is permanently connected at all times except in case of emergency.

The simplicity of operation and accuracy of control recommend electrical operation of lifting car dumpers where the fundamental functions are considerably involved, and where automatic regulation may be obtained by electrical devices.

By no means the least important consideration is the economy of power consumption attained by electrical operation. Although extensive calculations have indicated theoretically that great economies could be secured by Ward-Leonard control and proper counterbalancing methods, it was the actual operation of this equipment which positively demonstrated the great economies possible. Records of this operation show a power consumption of approximately 0.27 kilowatt-hour per ton of coal handled.



FRONT VIEW OF CAR DUMPER FROM BOAT, SHOWING CRADLE INVERTED

Fan-Shaped Hydrogen Arc Flame

Welding Process More Widely Applied

American Welding Society Conducts Fall Meeting at Buffalo

Research Bureau Reports Progress and Plans for Expansion

EVIDENCE that welding processes have reached major importance in American industry permeated all sessions of the American Welding society which conducted its sixth fall meeting at the Broadway auditorium, Buffalo, Nov. 16-19. Attendance at meetings exceeded 200 and constituted a record. Progress and economies of the electric, gas and thermit methods of joining metals together were ably discussed in the numerous technical papers, but final emphasis on achievements was secured through the most complete exposition of welded products and demonstrations of welding and cutting equipment. Visitors to the exposition, which is reviewed in detail on page 1393 of this issue of IRON TRADE REVIEW, were impressed with the wide application of welding and its future.

Welding of structural steel received a good share of attention and while authorities are agreed as to its practicability and efficiency, the lack of inspection methods to determine effectiveness of welds is withholding the indorsement of structural engineers. Tests conducted during the past year proved most encouraging and further research now is under way. This year for the first time the society considered welding science in the curriculum of engineering schools and was gratified to learn of the extensive instruction that some universities provide.

An open meeting of the welding wire specifications committee rather clearly developed the need for more rigid specifications for wire and electrodes. Research on the subject has developed much useful information but the work must be carried further before definite recommendations can be made. The American Bureau of Welding, the research division of the society, reported a satisfactory year and has laid plans for expanded activity for the next year. The principal feature of entertainment was a banquet served at the Hotel Statler on Thursday evening.

Railroads Find Welding Economical in Repair Work

AMERICA leads the world industrially because of its ability to organize and its close employer-employe relations, according to G. C. Lehmann, general manager, Buffalo chamber of commerce, who at the opening session on Wednesday morning welcomed the American Welding society to Buffalo. Labor conditions in England and France are such that rapid industrial progress is not to be expected for some time to come, but Germany, he said, is alive to its opportunities and rapidly is coming to the front. Mr. Lehmann also spoke of the British coal strike which has increased export shipments of coal to the point where sufficient railway cars are not available to handle grain and other shipments in the country.

Welding and its application to the railroads was the subject of the technical session on Thursday morning, at which A. G. Oehler, associate editor, *Railway Age*, presided as chairman. In an illustrated paper on this subject, G. H. Gjertsen, master welder, Northern Pacific railway, outlined the most common applications of fusion welding in the construction and maintenance of locomotives and suggested the best methods to be employed. To determine the success and economy of the various applications, the speaker urged that careful and complete records be kept. Failures of welds must be made known to those who performed the work in order that the cause of failure be found. In concluding, Mr. Gjertsen, said that while railroads had made rapid progress in the last few years, much remains to be done before the full economy and value can be received.

In a more extensive paper on the same subject, F. H. Williams, assistant test engineer, Canadian National railways, discussed in detail the training of operators, inspection and testing, selection of material, design of parts, organization of supervisory force, standard instructions, control of method and procedure, check on service results and economies. The speaker said that actual figures on economies would be hard to obtain, but even under the most unfavorable conditions, welding is a great economic factor in both time and money. A number of lantern slides illustrated typical uses of welding in the railroad shop while seven appendices accompanying the paper gave data on costs, maintenance regulation and results of tests.

Discussion of these papers by various members of the society was limited to questions concerning details of processes and costs, however, the number of speakers participating was indicative of the interest which railroads are showing in this method of maintaining their rolling stock.

It was unanimously agreed that economies are enormous.

Two papers on welding structural steel attention at the afternoon session at which J. H. Edwards, assistant chief engineer, American Bridge Co., New York, presided. The design of structural steel joint for arc welded connections was explained by A. M. Candy, welding engineer, Westinghouse Eelectric & Mfg. Co., East Pittsburgh, Pa. This paper described tests which the Westinghouse company has been conducting at Carnegie Institute of Technology and which proved so satisfactory that the company now is constructing by welded connection a 5-story, 70 x 220-foot mill-type building 80 feet high at its Sharon, Pa., works.

Welded Joints Prove Satisfactory

The prevailing impression among witnesses was that these tests demonstrated the superiority of welded connections to riveted connections in every case where direct comparisons were made and brought out two points:

1. That complete continuity of lines of beams can be obtained in welded construction, whereas it is well-known that this cannot be done in riveted construction.

2. That in a welded building it will be possible to make every joint full strength of the main members, whereas in a riveted building many joints are weaker than the members due to the weakening effects of the rivet holes and the weakness of steel angles which have to be used for transmitting tension between two members at right angles to each other.

According to Mr. Candy, it was proved that a welded girder was 50 per cent stronger than the riveted girder of relative depth, length and weight. The tests also proved the entire practicability of welding without any misgivings as to safety.

Oxyacetylene welding of structural steel was discussed in another paper presented by H. H. Moss, Linde Air Products Co., Buffalo. Following a study of the subject for several years, the Linde company last spring conducted a series of tests on welded roof trusses and obtained gratifying results. Preliminary investigation had revealed the efficiency of the insert plate design, consequently the trusses were designed on that principle. According to Mr. Moss, conclusions drawn by the experiments are as follows:

Fundamentally and practically the insert plate joint is a step in the right direction toward solution of the problem of joining structural steel by oxyacetylene welding, the method of joining being sound. A 15 per cent rigidity in favor of welding was found. Material savings in weight of steel necessary for a structure of this type can be made, compared with present methods of fabrication. Welding by this method does not inject negative factors of strength in a completed truss structure, nor in the base metal adjacent to the welds. The shop work proved to be simple and attended with but few mining difficulties. Good alignment of members was maintained by following recognized welding practices.

Nondestructive Tests A Deterrent

Wide discussion was conducted on these two papers and was convincing evidence that welding of structural steel is practical and economical. However, the method is new and civil and structural engineers are slow to recognize it, there being no precedent in design or service to point the way. Welding engineers are agreed as to the Practicability and safety of the process, but lack of a nondestructive test to prove the efficiency of a weld is holding back general progress. At present, prospects for such a test are none too bright, however, it was felt that engineers and the public will gain confidence in welding through several structures now being erected.

Colleges Giving Valuable Aid to Welding Industry

UNIVERSITIES are performing a distinct service to the welding industry through courses of instruction in welding theory and practice. This fact was brought out forcibly by several speakers at the session on Thursday morning, with Prof. C. A. Adams, Harvard university, Cambridge, Mass., as chairman. Prof. S. T. Hart, Syracuse university; Prof. R. D. Rickley, Ohio State university; and Prof. F. V. Larkin, Lehigh university, presented brief papers on this subject. In addition, papers prepared by Prof. W. P. Turner, Purdue university, and Prof. E. L. Lucas, Mississippi Agricultural and Mechanical college were read before the meeting.

This session on welding education was the first conducted by the society and it pretty clearly demonstrated that colleges and universities are doing more for the welding industry than it had been generally appreciated. The papers presented pointed out that it is not the intention of technical schools to turn out expert welders, consequently practical weld making is limited. The purpose is to acquaint students with the various forms of welding, the theory involved and the applications of each. Actual training of welders for production work properly should be the function of trade schools. According to the college representatives, present instruction is largely confined to lectures and acquainting students with types of equipment.

All speakers who discussed the various papers expressed surprise at the extent to which welding education has been provided, inasmuch as a few years ago engineering courses provided no such instruction, graduates now being turned out with a good idea of fundamentals in the processes. Prof. Adams urged the society undertake standardization of welding terms and provide definitions in order that a better working knowledge be obtained.

Classifies Welding Processes

James W. Owens, director of welding, Newport New Shipbuilding & Dry Dock Co., Newport News, Va., presented a written discussion of welding education in which he outlined in detail what instruction should include and suggested subjects for lectures. In addition, he distributed in blue print form a diagram of welding as a method of joining metals and their interlation. This diagram is reproduced on page 1366. Another speaker on the same subject urged that colleges provide more instruction in the design of welded joints, this applying particularly to the civil and structural engineering departments. Likewise, more extensive research would be desirable.

On Thursday afternoon a meeting of the welding wire specifications committee was held with C. A. McCune, director of research, American Chain Co., Bridgeport, Conn., chairman of the committee acting as chairman. The unusually large attendance at this session indicated the interest in the subject. Mr. McCune reported that during the past year a rather complete investigation of welding wire has been under way on many samples of wire. Tests were made for chemical content, grain structure and weldability. However, he reported that results were so varied that no definite conclusions could be drawn, or recommendations made. Nevertheless, he said it was evident that more rigid requirements for wire were necessary.

Following Mr. McCune's report, chairmen of various subcommittees re-

ported the progress of their groups. Among these subcommittees were those on bare electrodes, coated electrodes and nonferrous electrodes. S. W. Miller, consulting engineer, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., chairman of the gas welding wire committee, iron and steel, traced the development of wire. Until the war only Norway or Swedish iron was employed, but when it become impossible. to get this material, steel wire was substituted and now is in general use with satisfactory results. J. C. Lincoln, president, Lincoln Electric Co., Cleveland, stated that little is known about the theory of arc welding rods and electrodes, however, considerable practical information is at hand. H. L. Whittemore, chief, engineering mechanics section, bureau of standards, Washington, stated that tests conducted at the bureau indicated that of welds were discussed in a report by H. L. Whittemore, who described the most recent equipment available for the purpose and the progress of tests.

S. W. Miller, chairman of the gas welding committee, devoted most of his attention to procedure control and strongly recommended that infomation in the hands of the bureau should be widely distributed for the good of the industry. Nondestructive tests of welds was the subject of a few remarks by A. V de Forrest, research engineer, American Chain Co., Bridgeport, Conn., who designated the tests as X-ray, magnetic and electrical resistance. The X-ray is adaptable to small sections but is not a shop test. Both the magnetic and electrical resistance tests are difficult to apply because of their delicacy and will require much research to make them

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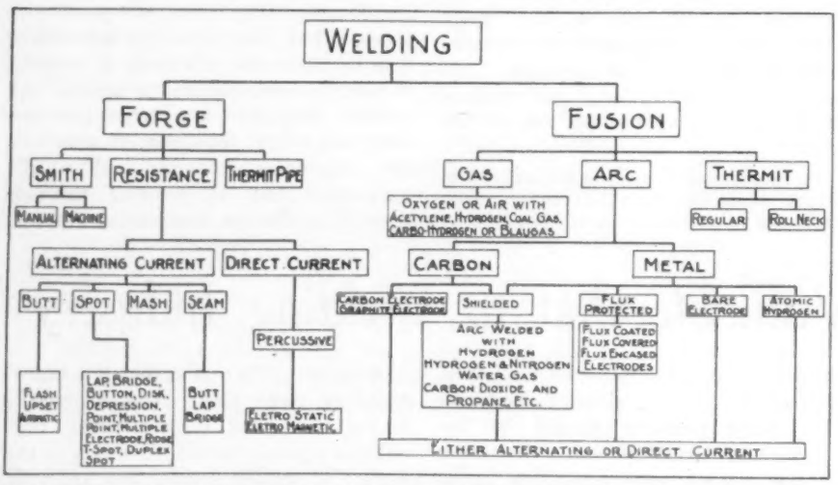

A CLASSIFICATION OF METHODS OF WELDING PREPARED BY JAMES W. OWENS. THE DIFFERENCE BETWEEN FORGE AND FUSION WELDING IS THAT A HAMMER BLOW OR PRESSURE IS USED TO COMPLETE FUSION IN FORGE WELDING, WHEREAS IN FUSION WELDING, FUSION IS COMPLETED WITHOUT THE USE OF EITHER

gas in welding wire is not a factor in weld quality.

At another session held later in the afternoon, the American Bureau of Welding, the research department of the society, conducted an open meeting with Director C. A. Adams, officiating as chairman. A report prepared by H. M. Hobart, consulting engineer, General Electric Co., Schenectady, N. Y., and chairman of the committee on electric arc welding recommended a rearrangement of subcommittees to provide for more extensive fundamental research on the arc method of joining metals. The new plan is expected to prove advantageous, covering a broader range of investigation. W. Spraragen, division of engineering, National research council, submitted a report on investigations of welds subjected to high temperatures. Fatigue investigations

Gas Purification Aids Open Hearth Output

(*Concluded from Page* 1359)

most cases a steelworks can dispose of the actifier air in boilers or in some other combustion operation so that the Seaboard process may readily be employed and deserves first consideration on account of its simplicity and low cost. Gas plants, on the other hand, may find themselves embarrassed by more of this air than they have an outlet for and by the fact that they are usually situated in more densely populated districts than steelworks. Although the sulphur recovery type of plant is not as simple to operate as the Seaboard type and has higher investment and operating costs, it may be of interest to describe this type of equipment.

This operation is substantially similar to that of the Seaboard process in that the sulphur is removed by scrubbing with a sodium carbonate solution. The chief points of difference are (first) that an agent, such as an iron compound, is employed to carry the reaction between the hydrogen sulphide and the sodium carbonate to completion and effect 100 per cent removal if desired, and (second) that the hydrogen sulphide is recovered in the form of elemental sulphur instead of being discharged into the atmosphere in its original state. The Seaboard process, on the other hand, cannot effect 100 per cent removal of the sulphur without auxiliary oxide boxes or an additional scrubbing unit in series with the main unit.

Principal apparatus in one practical development of the Koppers Co. sulphur recovery process is shown in Fig. 3. This is essentially the apparatus employed in the demonstration plant at the plant of the Seaboard By-Product Coke Co. and at the plants of the Laclede Gas Light Co. and the Detroit City Gas Co., at St. Louis and Detroit, respectively. The apparatus includes an absorber, in which the gas is brought into contact with a circulating liquid, and a so-called thionizer, in which the solution coming from the absorber is subjected to the action of finely atomized air. The air requirement of the sulphur recovery process is only 10 per cent of that used in the Seaboard process and the waste air exhausted to atmosphere contains no impurities.

The circulating liquid consists of a dilute solution of sodium carbonate, usually containing from 0.5 to 3 per cent sodium carbonate, and having an iron compound in solution or in suspension.

The efficiency of purification by this new process is high and it is readily possible to remove 100 per cent of the hydrogen sulphide and hydrocyanic acid in a single scrubbing, whereas the best removal that is obtained in a single washing by the Seaboard process is not usually over 95 per cent. As all hydrocyanic acid is converted into sodium thiocyanate and more sodium thiosulphate is formed than in the Seaboard process, the soda consumption is greater and the operating cost of the new process higher.

Based on the results obtained at the Seaboard and St. Louis plants, the cost of treating twenty million cubic feet of gas, for the removal of 400 grains of hydrogen sulphide per one hundred cubic feet, is estimated at 1.37c per thousand feet of gas purified.

Editorials

Automobile Industry Checks Itself

FOLLOWING the unhappy experience of the spring of 1924 when the automobile industry was caught in a slow market with a large surplus of cars, certain large companies enunciated a policy of holding production in line with retail sales. At present statistics of stocks of finished cars show a sharply rising trend, reminiscent of this time in 1923. The question naturally arises whether the motor car industry is going to repeat its mistake of three years ago.

Apparently such a repetition is unlikely. Production of cars already has begun to be curtailed substantially. October figures, just announced, show a reduction of 15 per cent from September. November is bringing increased slackening of production which is likely to continue until early in January.

Despite the retardation of output and the announced policy of keeping production matched with retail demand, avoidance of accumulation of stocks of cars in the winter is not practical in the automobile industry. This is true because the demand for cars always comes to a peak in the spring. Automobile manufacturers, therefore, find it necessary to provide for this peak. In 1924 there was overoptimism regarding the volume of spring demand. This season, apparently, producers are determined to go slower and await a clearer indication of buying demand next spring. Meanwhile a moderate building up of motor stocks this winter need not be regarded as unfavorable.

Founders' Growth Connotes Progress

SO CLOSELY has the National Founders' association been linked with notable developments in the foundry field in the past 29 years President Barr's review of association activities, at the annual convention in New York last week, would pass as a concise history of the foundry industry in that period. In the review were depicted the early struggles of forward-looking employers against the evils of the closed shop, their fight against restrictions on improved appliances, and their furthering of safety, welfare and educational work.

The number of union foundries in the membership of the association, according to its president, is today only 10 per cent, compared with 90 per cent in 1904. That date marked the definite break between the association and unionism following strenuous efforts to make effective the policy of collective bargaining. Since that time membership of the molders' union has steadily declined from nearly 90,000 to less than 29,000, and by utilization of improved methods member companies today are pouring twice as much iron per molder as 20 years ago. As set down by President Barr, the policy of equality of opportunity for employer and employe, fair play, fair pay and strict justice is bearing fruit.

Times Change in Finance

IN 1902 when the then new United States Steel Corp. proposed to retire $200,000,000 of 7 per cent preferred stock and substitute a like amount of 5 per cent second mortgage bonds criticism was so severe the plan was dropped. Today the Standard Oil Co. of New Jersey is retiring the identical amount of preferred by issuing 5 per cent debentures and the operation is applauded. Large sums do not seem so formidable now.

Not Vertical, Yet Equitable

FOR decidedly practical reasons hand-to-mouth buying cannot be a vertical manifestation in the iron and steel industry. This year almost 61,000,000 tons of iron ore will be brought down the Great Lakes, a tonnage considerably above the average; it is mandatory that winter ore requirements be covered before navigation closes. Figures on stockpiles of coal are unobtainable but many hundred thousand tons are being thrown down; uncertain winter transportation is one consideration, while the possibility of a coal strike next spring is a momentary spur.

Here are the two basic materials of the iron and steel industry—ore and fuel—coming to the producer of primary materials in huge tonnages. Through the bottle neck of his blast furnaces, open hearths and rolling mills they are converted into finished material and then spread fan-like among a multitude of users. Secondary interests can order their raw material, which is the product of the primary producer, from week to week and be assured of an uninterrupted flow. But the primary producer cannot order his raw materials—ore and fuel—on a weekly basis. He must be fortified, have a background of materials at

all times—as much as six months on ore at some seasons.

Nevertheless, the producer of primary materials is not complaining stridently. He would, of course, prefer better balanced schedules as a means of lowering costs but as President Grace of the Bethlehem Steel Corp., and others have observed recently, there are compensations in the way of leveling off the peaks and filling in the valleys of production and a more stable condition generally, especially of employment. That there are compensations below as well as above the line confirms the economic equitableness of hand-to-mouth buying.

Tool Buying Good, But Not a Record

CONTRARY to earlier expectations, it now appears that machine tool buying this year, although good, will fall short of business in 1923, the best since the war. In the first half year, in fact the first seven or eight months, prospects for a new record being established were promising. The first half perhaps was not the best since the war, yet it showed a marked improvement over the corresponding period of the year before, and of particular promise was the railroad outlook.

The carriers were in a steadily improving financial position; they needed equipment, and their earlier purchases indicated a direction of thought to that condition. In the first seven months their purchases were at a rate better than the average normal which they are supposed to take of the country's requirements—about 25 per cent. However, in August their purchases became spotty, and general industrial buying slumped, and there has been no great improvement since. With only five weeks left, a new record for this year appears out of the question.

That the year, however, has been a good one for most sellers is not to be denied. It has certainly been better than last year; and were business to flatten out materially between now and the first of next year, which is improbable, builders would still have enough business to carry them well into January.

Business Goes Round the Circle

BUSINESS, like history, repeats itself. At the recent annual meeting of the Manufacturers' Association of Connecticut E. Kent Hubbard, president, quoted from the presidential address of the association's forerunner 100 years ago:

"It is the duty of the American government, it is in the interest of the American people, to protect their own fabrics even on the principle of ultimate economy. In the course of a few years a saving will thus be made, not only to the nation but also to the individuals. It is urged that there are many kinds of goods which cannot be made of equal quality here. We answer, let our own be properly encouraged and this objection will be overcome. It is not long since we imported nearly all our nails, hardware, boots and shoes and coarser kinds of ironmongery. Who doubts the aptitude of Americans for the manufacturing art?"

How like the tariff discussion of today! From 1810 to 1825 the matter of research was as acute as it is today. Taxation was a vexing problem. Transportation at reasonable rates was demanded. The recurrence of these conditions in successive periods of business is evidence that they have not been solved; human experience today differs from that of 100 years ago only as to plane. But there is encouragement in the thought that the nation has prospered despite their urgency, and will so continue.

What Our Readers Are Thinking

Industrial Training Is What Counts

FOR the past 50 years industry has been so busy increasing plant facilities, devising more efficient means of production, and designing and building new machinery and tools that little attention has been given to the training of the boy, the mechanic and the executive, fitting them to become the future source of skilled labor for the industrial world.

Modern development of the manufacturing industries has firmly established the principle of specialization. Specialized methods have made feasible the employment of a larger proportion of unskilled and semiskilled labor in the industries than was possible in the earlier days and less attention has been paid to the question of renewing the supply of skilled workers and future executives. As a consequence, the scarcity of skilled labor has become apparent during the last decade and during the past few years manufacturers have been forced to consider the problem of training the boy and the man for their logical place in industrial life.

The war taught American industry that need of systematic training was very vital in the producing of skilled labor. Hundreds of concerns throughout the country have learned through proper training and supervision that a training system can be made to produce results which will supply their plants with skilled labor and give them a future source from which to draw their shop leaders. The value of this training is incalculable, not only to the industry but to the individual and the community. Today, more than ever before, production is largely controlled by man's ability to produce a maximum output in a minimum time. In order to do this in an efficient manner, industries must have their ability well organized along these lines.—F. W. BACON, *personnel director, Marion Steam Shovel Co., Marion, O., in Open Shop Review.*

The Reader's Page

Vol. LXXIX, No. 22 IRON TRADE REVIEW Nov. 25, 1926

Industrial Furnaces Treated in Comprehensive Way

THE series of articles on industrial furnaces that have been published in IRON TRADE REVIEW since Sept. 2 is attracting considerable attention. The author, Charles Longenecker, furnace engineer, with abundant experience, is dealing in a comprehensive way with the many types of industrial furnaces, and from the standpoints of design, construction, product, fuels and methods of firing, function, and their position in relation to the industry as a whole. The articles are being published every other week; they are especially written for IRON TRADE REVIEW, in a clear, informative style and are well illustrated. This week's installment, on intermediate or heating furnaces, deals particularly with the heating of small ingots and ingots intended for large forgings. The next article will begin the fourth chapter, and will feature furnaces of the continuous type.

Welding Exposition Held in Buffalo. Page 1393.

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The Business Trend

Autumn Business on High Level

By JOHN W. HILL, Financial Editor

GENERAL business this autumn has clung to a high level, despite some slackening in a few lines. IRON TRADE REVIEW'S Monthly Business Index for October stands at the highest point for any month on record with the single exception of October, 1925. The most striking increases in October were for freight traffic and coal production.

THE level of commodity prices showed little change during the month. During October Bradstreet's index declined four-tenths of 1 per cent. The price level is now about 5 per cent lower than it was one year ago. The decline of the past year is largely due to lower prices for farm products.

DURING the last two or three years wholesale prices have been fluctuating roughly around 50 per cent over the 1913 basis. It is probable that prices will remain in this range for some years to come. The bureau of labor statistics index for October stands at 149.7 per cent of 1913 against 150.5 per cent in the preceding month and 157.5 per cent one year before.

PRICE movements have been confused. Of 404 commodities in the bureau's index 107 advanced in October and 114 of them declined. Notable examples of the mixed trend are seen in the spectacular rise of coal and in the heavy fall of cotton.

IN THE decline of cotton is found the chief explanation for the poor showing of export trade in October. The total value of shipments of American goods during the month was $457,000,000 an increase of only 1.5 per cent over the September total. That was less than the usual seasonal gain in October, probably accounted for by low cotton prices.

GOOD foreign trade, big building volumes and easy credit were among the factors causing last summer's great industrial activities. Measured by values foreign trade is less favorable, while building shows a small downward tendency. But contract awards are too high to permit of a sharp drop in building activities in the near future. Meanwhile the great bulwark in the situation is undisturbedly easy money.

The Barometer of Business

Industrial Indicators

	Oct., 1926	One month ago	One year ago	1913
Pig iron output (Daily average, tons)	107,000	105,000	97,351	83,900
Blast furnace index 60 per cent—normal	58.5	58.2	54.1	62.8
Unfilled orders (tons)	3,685,000	3,593,000	4,109,183	4,513,000
Ingot output (Daily average, tons)	157,406	151,180	144,030	
Dodge Bldg., awards in 27 states (sq. ft.)	62,000,000	64,600,000	69,305,000	31,250,000
Automobile output	348,000	413,000	454,000	
Coal output, tons	54,000,000	47,000,000	53,419,000	39,869,000
Business failures; number	1,763	1,437	1,581	1,336
Business failures; liabilities	$33,280,000	$29,989,817	$29,543,870	$22,732,000
Cement production, Bbls.	16,596,000	16,571,000	15,992,000	7,704,000
Cotton consumption, bales	568,532	571,105	543,679	438,218
Car loadings (weekly average	1,189,000	1,138,000	1,107,000	

Foreign Trade

	October	One month ago	One year ago	1913
Exports	$457,000,000	$450,000,000	$490,560,000	$194,000,000
Imports	$383,000,000	$345,000,000	$374,073,000	$149,900,000
Gold exports	$1,115,004	$23,743,000	$28,039,190	$5,234,000
Gold imports	$8,443,866	$15,932,998	$50,740,649	$5,900,000

Foreign Exchange

	Normal	Nov. 23	One month ago	One year ago
Sterling	$4.86	$4.84 9/16	$4.84	$4.84
Francs	19.3c	3.56c	3.07c	3.89c
Lira	19.3c	4.22c	4.47c	3.99c
Marks	23.8c	23.70c	23.81c	23.81c

Financial Indicators

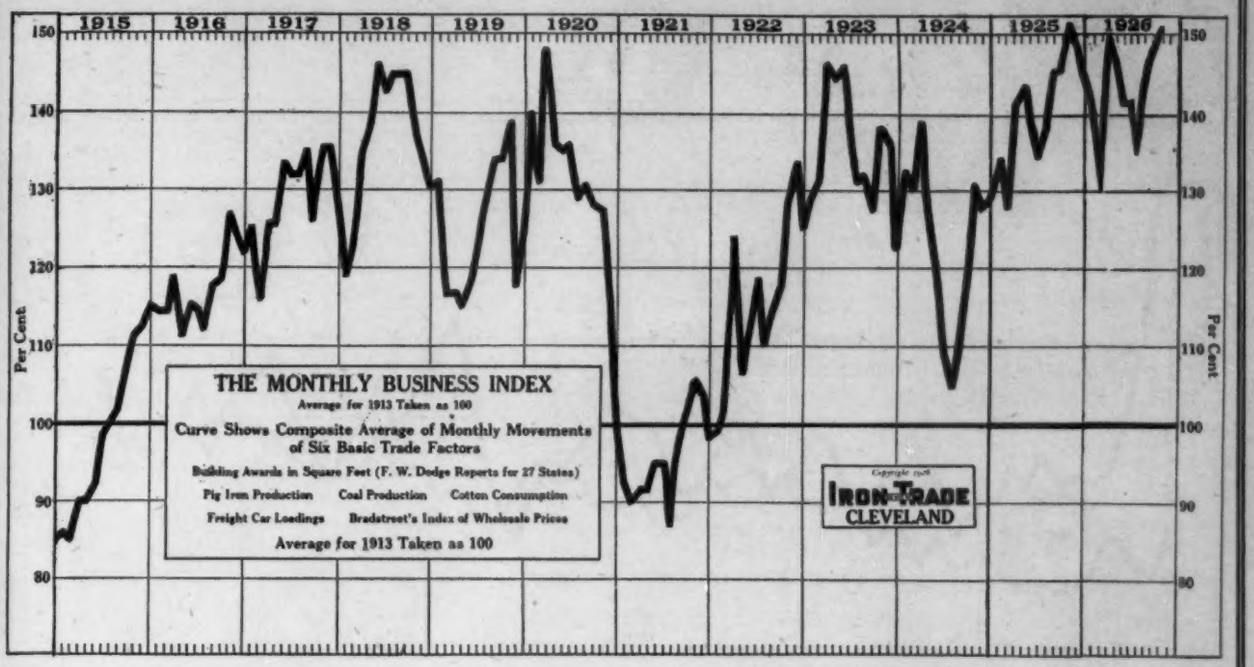
	Oct., 1926	One month ago	One year ago	1913
25 Industrial stocks	**$172.63	$164.06	$172.37	$58.19
25 Rail stocks	**$97.08	$95.17	$89.15	$82.90
40 Bonds	**$89.01	$87.63	$84.71	$93.00
Bank clearings (000 omitted)	$44,905,000	$40,166,553	$47,273,000	$13,895,000
Commercial paper rate (N. Y., per cent)	4½-4¾	4½-4¾	4¼	5.60
*Commercial loans (000 omitted)	$8,798,852	$8,728,278	$8,468,569	
Federal reserve ratio, per cent	73.8	74	72.1	
Railroad earnings	†$145,000,000	$133,000,000	$134,000,000	$59,301,000
Stock sales, N. Y. stock exchange	40,437,374	37,030,166	54,091,794	6,924,000
Bond sales, par value	$219,671,450	$192,931,900	$260,533,700	$41,499,000

*Leading member banks Federal Reserve System.
†September, 1926.
**Nov. 22, 1926.

Commodity Prices

	Nov. 1, 1926	One month ago	One year ago	1913
U. S. Bureau of Labor statistics	149.7	150.5	157.6	100
Bradstreet's index	137.9	138	155	100
Economist's (British)	155.9	156	159.2	100
Wheat, cash (bushel)	$1.39	$1.41	$1.73	92c
Corn, cash (bushel)	71c	77c	82c	51c
Petroleum, crude (Bbl.)	$3.15	$3.40	$3.15	$2.50

The Business Trend

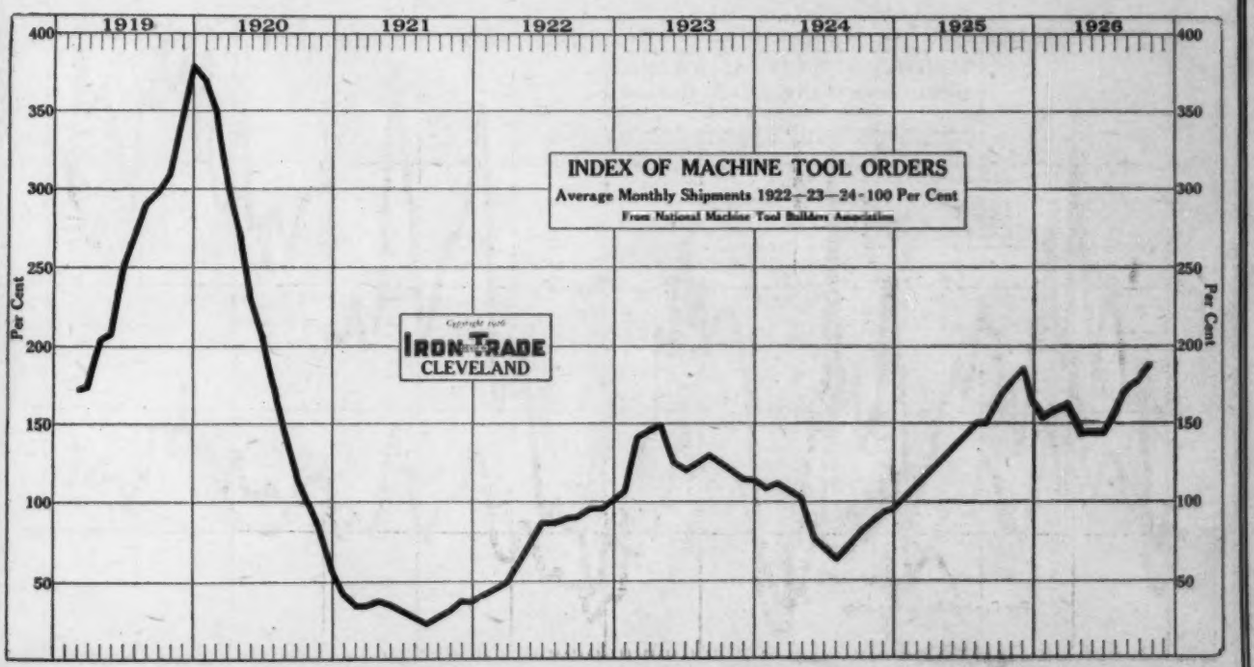


Business Index

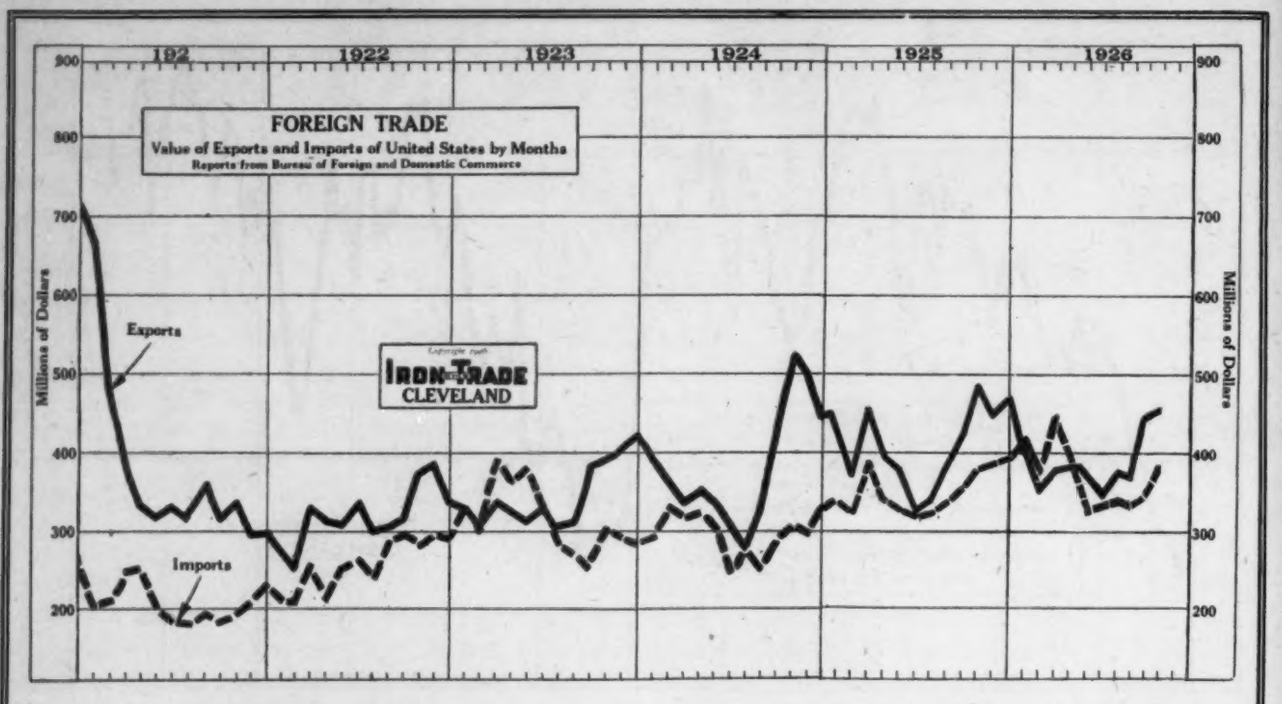
IRON TRADE REVIEW Monthly Business Index for October was the highest of any month since October, 1925 and with that exception it was the highest for any month on record. The index stood at 151 against 147 in September and 152 in October, 1925. The gains in October over the preceding month were for pig iron production, freight traffic and coal production. Factors in the index showing declines for October were Bradstreet's prices, cotton consumption and building.

Machine Tool Orders

ORDERS for machine tools in October were at the highest point since last fall, according to the index computed by the National Machine Tool Builders association. The trend of three months average of gross orders depicted in the chart remains upward. For August, September and October the average stands at 185.5 compared with 178.2 for one month before. Continued expansion in industry is indicated by the record.



The Business Trend

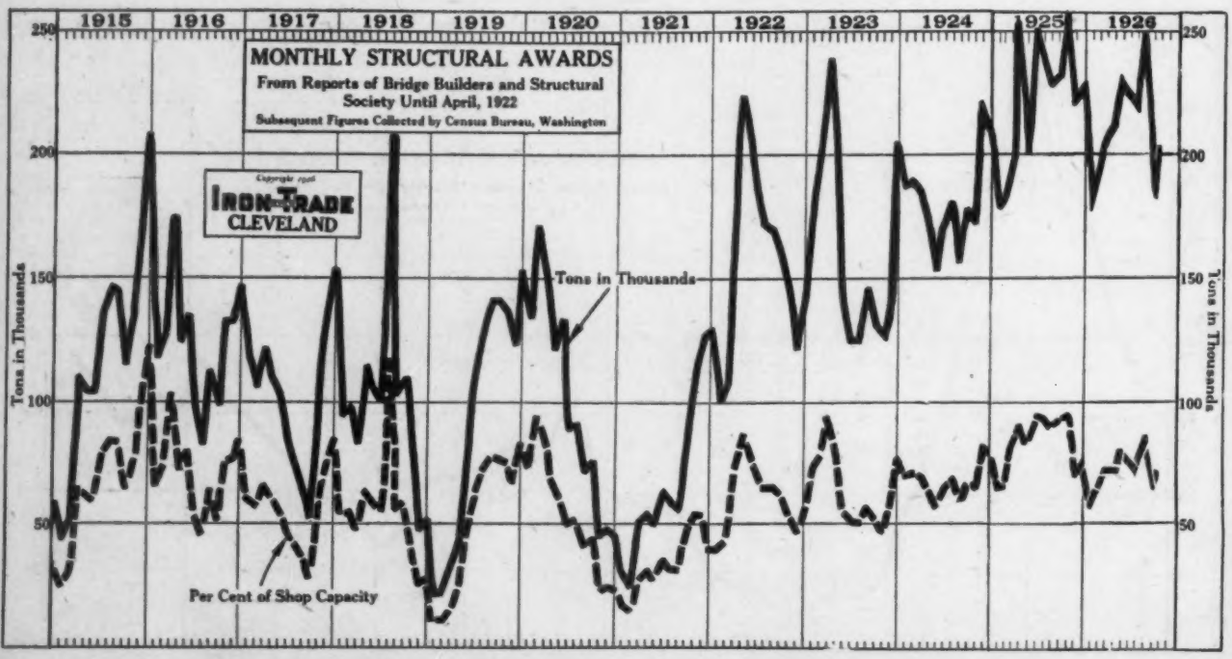


Foreign Trade

EXPORTS of American merchandise in October amounted to $457,000,000. This was an increase of only 1.5 per cent over September, a much smaller than normal gain, a fact partly due to lower prices for cotton. Compared with October one year ago, there was a decline of 6.9 per cent. Imports of $383,000,000 showed an increase of 11 per cent over September and 2.4 per cent over October, 1925. The excess of exports over imports was $74,000,000 against $105,000,000 in September.

Structural Awards

BOOKINGS of fabricated structural steel in October were 67 per cent of capacity. The computed tonnage for the month was 204,350 tons against 183,000 in September and 271,415 in October, 1925. The percentage of capacity in October compared with 60 per cent in September and 89 per cent in October, 1925. Shipments were 83 per cent of capacity, unchanged from September and comparing with 88 per cent in October, 1925. The level of building activities is below one year ago.



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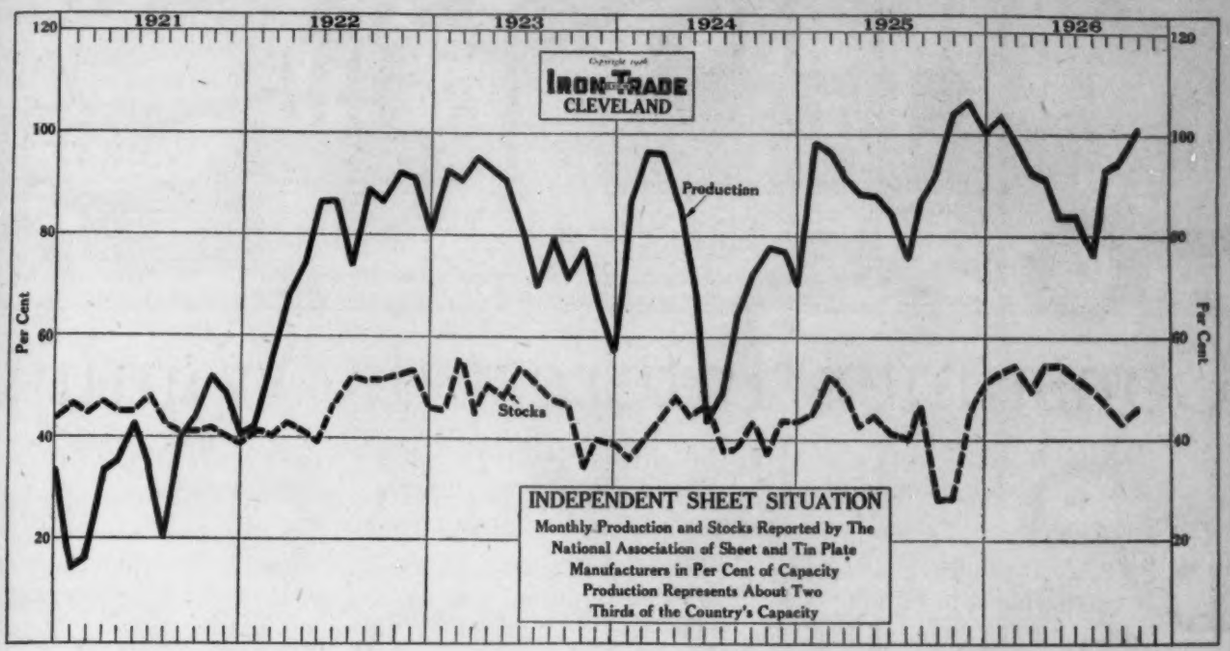
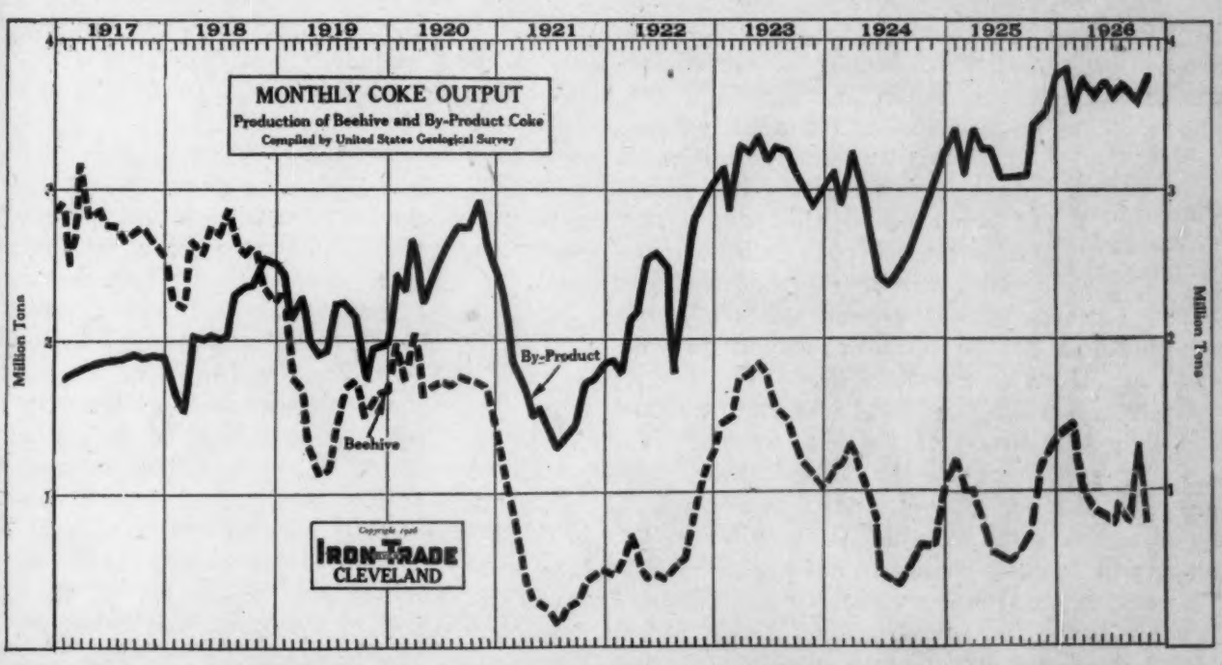


Independent Sheets

THE curve of production of mills reported by the National Association of Sheet & Tin Plate Manufacturers for October climbed to 101.4 per cent during the month compared with 96 per cent in September and 92 per cent in August. Sales for the month declined to 68.3 per cent and shipments were 97.2 per cent of capacity. Stocks increased from 42 per cent in September to 45 per cent in October as a result of the increase in production. The lower level of sales foreshadows lessened outputs.

Coke Production

PRODUCTION of by-product coke during October amounted to 3,812,000 tons an increase of 4.7 per cent over the output of 3,641,000 tons in September. Except for January, 1926 the October output is the highest on record. Beehive coke output for October declined decidedly, the estimate total being 867,000 tons per month compared with 1,312,000 tons made in September, a decline of 34 per cent. This drop was due to the withdrawal of coal from coke making to sell at soaring prices on the coal market.



Consumer Interest Is Waning

Both Finished Steel and Pig Iron Develop Further Contraction in Buying, Although Shipments Are Fair—Some Current Orders Are for January Delivery—Inventories Are Falling to Record Low

DEMAND for finished steel as well as for pig iron continues to shrink. Consumers generally seem intent on reducing their inventories and express no fear as to supplies or prices. From the fact that shipments of steel have exceeded new business in the past week it is evident that consumption has been maintained on a slightly higher plane than buying would indicate, but by the same token whatever backlogs the mills have accumulated are being rapidly depleted. Finished steel production this week is not averaging over 75 per cent for all districts, although Steel corporation subsidiaries approximate 80 per cent, and the tendency is downward.

Prices of finished steel are not now of paramount interest to consumers. In the Pittsburgh, Chicago and eastern Pennsylvania districts producers have solicited first quarter business at current levels but have not corralled much. While the price structure has not been subjected to any decisive test recently, due largely to the indifference of buyers, each passing week with a subsidence of buying weakens its technical position.

Fuel Loses Weight

Up to this time the fuel situation has helped to sustain the morale of producers but this prop is now withdrawn. Producers believe December will develop sufficient first quarter business to hold present levels but tonnage business in the meantime might provoke price competition among the mills.

A fair proportion of recent bookings of finished steel calls for delivery in the first week of January. It seems probable that inventories of consumers at the close of the year will be at a record low level. A tight situation in supplies in the forepart of January could develop easily.

Interest in pig iron is comparably low. Melters view the easier fuel situation as a factor favorable to them and are disposed to delay covering for first quarter. Probably less than half the normal first quarter requirement of iron was contracted for in the recent buying movement. Pig iron prices generally are easier and in some districts are no more than asking prices.

Auto Output Still Off

Improvement in the automotive industry is still more a hope than a promise. October production was 15 per cent under September and November will show a further loss. Purchases of steel by Detroit automotive interests in the first half of November were less than 50 per cent of those in the first half of October. The result has been further pressure upon prices at Detroit.

Structural shape and concrete bar activity in all districts is sliding off as unfavorable building weather approaches. While structural awards have not been above seasonal average, they have been featured by the placement of 10,000 tons for Fox theater and office buildings in Detroit, St. Louis and Brooklyn and 5000 tons for a hotel in Milwaukee.

Chicago district rail mills have booked a total of 25,000 tons in the past week, while the Boston & Maine bought 10,000 tons. New business in track fastenings includes 8000 tons placed at Chicago.

Car Inquiries Loom Big

With the Illinois Central railroad expected to inquire for 8000 to 9000 freight cars and the Norfolk & Western for 2000, the outlook for the car building industry has improved. Should this business develop, it would require 100,000 to 110,000 tons of finished material. Actual new inquiry includes 500 hoppers and 250 automobile cars by the Lehigh Valley. The week's car awards are headed by 500 by the American Refrigerator Transit Co. to the General-American Tank Car Corp. and 201 refrigerator cars by the Northern Refrigerator Car Co.

to the Pullman Car & Mfg. Corp. The Pennsylvania railroad has placed 75 locomotives with the Baldwin Locomotive Works and the New York Central 70 tenders with the American Locomotive Co.

Beehive furnace coke has rebounded to $4.50, a rise of 25 cents over the recent minimum, now that selling pressure following the easier tone in the coal market has been relieved.

IRON TRADE REVIEW composite of fourteen leading iron and steel products continues to rise in spite of the setback of pig iron prices in some districts. This week it is $38.50, compared with $38.47 a week ago and $38.08 a month ago.

Prices, Present and Past

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Nov. 24, 1926	Oct., 1926	Aug., 1926	Nov., 1925
PIG IRON				
Bessemer, valley, del., Pittsburgh	$22.26	20.86	19.76	22.61
Basic, valley	19.00	17.85	17.50	19.85
Basic, eastern del., eastern Pa.	22.75	21.00	21.00	22.70
*No. 2 foundry, del., Pittsburgh	21.76	20.11	19.26	22.11
No. 2 foundry, Chicago	21.00	21.00	21.00	22.75
*Southern No. 2, Birmingham	20.00	20.00	21.00	21.00
*Southern Ohio, No. 2 Ironton	20.00	20.00	19.90	21.00
**No. 2X, Virginia furnace	23.00	22.50	22.75	23.00
**No. 2, eastern del., Phila.	23.76	22.51	22.01	24.01
Malleable, valley	20.00	18.35	17.50	20.35
Malleable, Chicago	21.00	21.00	21.00	22.75
Lake Superior charcoal, Chicago	27.04	27.04	29.04	29.04
Gray forge, val., del., Pittsburgh	21.26	19.61	19.01	21.61
Ferromanganese, del., Pittsburgh	104.79	99.79	92.79	119.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	4.50	3.65	2.85	6.35
Connellsville, foundry, ovens	5.50	4.65	3.60	6.85
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	36.00	36.00	36.00	35.25
Sheet bars, open-hearth, Pittsburgh	36.00	36.00	36.00	35.25
Billets, open-hearth, Pittsburgh	35.00	35.00	35.00	35.00
Wire rods, Pittsburgh	45.00	45.00	45.00	45.50
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.00	2.00	2.00	2.00
Steel bars, Chicago	2.10	2.10	2.10	2.10
Steel bars, Philadelphia	2.32	2.32	2.27	2.32
Iron bars, Philadelphia	2.27	2.22	2.27	2.22
Iron bars, Chicago, mill	2.00	2.00	2.00	2.00
Beams, Pittsburgh	2.00	2.00	2.00	1.85
Beams, Philadelphia	2.22	2.22	2.32	2.17
Beams, Chicago	2.10	2.10	2.10	2.10
Tank plates, Pittsburgh	1.90	1.90	1.90	1.85
Tank plates, Philadelphia	2.22	2.22	2.22	1.92
Tank plates, Chicago	2.10	2.10	2.10	2.10
Sheets, black, No. 24, Pittsburgh	3.10	3.05	3.10†	3.25†
Sheets, blue anl., No. 10, Pittsburgh	2.40	2.35	2.30	2.40
Sheets, galvanized, No. 24, Pittsburgh	3.95	3.90	4.30†	4.50†
Sheets, black, No. 24, Chicago	3.20	3.25	3.25†	3.45†
Sheets, blue anl., No. 10, Chicago	2.50	2.55	2.45	2.60
Sheets, galvanized, No. 24, Chicago	4.05	4.10	4.45†	4.70†
Wire nails, Pittsburgh	2.65	2.65	2.65	2.65
Wire nails, Chicago	2.70	2.70	2.70	2.70
Tin plate per base box, Pittsburgh	$5.50	5.50	5.50	5.50
†Based on No. 28 gage.				
OLD MATERIAL				
Heavy melting steel, Pittsburgh	17.00	17.00	17.75	19.50
Heavy melting steel, eastern Pa.	15.75	16.65	16.75	17.60
Heavy melting steel, Chicago	13.00	13.05	14.00	16.40
No. 1 wrought, eastern Pa.	16.00	17.00	17.25	18.75
No. 1 wrought, Chicago	14.50	14.50	14.75	17.70
Rails for rolling, Chicago	16.50	16.65	17.25	19.40

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Nov. 24, 1926)	$38.50
Last week (Nov. 17, 1926)	38.47
One month ago (October, 1926)	38.08
Three months ago (August, 1926)	37.61
One year ago (November, 1925)	38.73
Ten years ago (November, 1916)	46.77
Thirteen years ago (November, 1913)	24.02

Late News Flashes

Will Not Comment On Expansion

New York, Nov. 23.—L. B. Ladoux, president, Universal Pipe & Radiator Co., has declined to discuss the report his company plans to acquire a number of small pipe companies.

Pittsburgh Ingot Average Is 75 Per Cent

Pittsburgh, Nov. 23.—While some steelmakers are operating at above 75 per cent of ingot capacity, a sufficient number are nearer 70 per cent to make the general average for this district about 75.

Pollak Dismantling Its Cincinnati Plant

New York, Nov. 23.—The Pollak Steel Co. is dismantling its Cincinnati plant, transferring operations to its Marion, O., plant. The Simmons Machine Tool Co., New York, is liquidating the equipment, which includes more than 300 heavy items.

Blows Out Stack But Uses Cold Iron

Chicago, Nov. 23.—Blowing out of another blast furnace stack at the South Chicago works of the Illinois Steel Co. reduces the number of steelworks furnaces in blast here to 24 out of 36. It is reported this does not reduce the steel ingot rate appreciably as more cold metal is to be used.

Idle Capacity at Youngstown Grows

Youngstown, O., Nov. 23.—Independent steelmakers average a 65 per cent steel ingot rate, with Steel corporation subsidiaries slightly above 75 per cent. Finishing mill operations are unchanged or slightly better, excepting bar mills which average 50 per cent. Pipe and skelp production continues at 85 per cent.

Pact Promises Chicago Building Peace

Chicago, Nov. 23.—An agreement which it is hoped will bring peace to local building construction activities has been approved by the Building Trades council, the union organization, and will be submitted shortly to the Building Construction Employers' association. Both sides hail the treaty with favor, although it may eliminate the citizens' committee, set up in 1921 by the Landis award. A blanket clause covering all trades making agreements with the employers' association states that union members of the trades council shall not be required to work with nonunion workmen. Wages shall be fixed by a joint board of arbitration for each trade, the rate of wages being fixed prior to Feb. 1 each year during the life of the contract, which ends June 30, 1929.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Philadelphia	40.30
Chicago	35.00
Forging, Pittsburgh	40.00
Forging, Philadelphia	45.30

SHEET BARS

Pittsburgh	$36.00
Youngstown	36.00

SLABS

Pittsburgh	$35.00
Youngstown	35.00

WIRE RODS

Pittsburgh	45.00
Cleveland	45.00
Chicago	46.00

Standard extras, $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp	1.90c
Universal skelp, Pittsburgh	1.90c
Sheared skelp, Pittsburgh	1.90c

Structural Shapes

Pittsburgh	2.00c
Philadelphia	2.17c to 2.32c
New York	2.19c to 2.34c
Chicago	2.10c
Cleveland	2.19c
Birmingham	2.15c to 2.25c

Steel Plates

Pittsburgh	1.90c
Philadelphia	2.22c
New York	2.24c
Chicago	2.10c
Cleveland	2.09c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.00c to 2.10c
Pittsburgh, cold finishing	2.15c
Pittsburgh, forging quality	2.15c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
*Cleveland, soft steel	2.00c to 2.19c
Birmingham, soft steel	2.15c to 2.25c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	3.00c to 4.50c
Pittsburgh, reinforcing billet	2.00c to 2.10c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	2.00c
Mill, rail steel	1.80c
Philadelphia, common iron	2.22c to 2.32c
New York, common iron	2.24c to 2.34c
Chicago, common iron	2.00c

*The 2.00c price applies to a limited range of forms and sizes.

Hoops, Bands, Strips

Hoops, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh over 6 in.	2.30c
Hot rolled strip steel, Pittsburgh, stamping quality, over 6 in.	2.30c
Hot rolled strip steel, Chicago	2.50c to 2.60c
Bands, Chicago, under 6 inches	2.60c
Bands, Chicago, 6 in. and over	2.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh	3.25c to 3.60c
Worcester Mass	3.90c
Chicago	3.80c to 4.05c

Cold Finished Steel

Cold finished steel bars, drawn, or rolled, Pittsburgh, Chicago carloads	2.40c
Less carload	2.50c to 2.65c
Steel shafting turned and polished Pittsburgh, Chicago	2.60c

Screw stock base Cleveland $1 higher than Pittsburgh and Chicago.

Hot Rolled Alloy Steel

Pittsburgh or Chicago

S. A. E. Series—	
2300 (3½ per cent nickel	4.40c to 4.50c
3100 (Nickel chromium)	3.40c to 3.50c
6100 (Chrome vanadium)	4.25c to 4.30c
6100 (Chrome vanad. spring)	3.85c
9250 Silico-mang. spring)	3.25c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relaying rails, Pittsburgh	23.00 to 25.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c to 2.90c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.90c to 3.00c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.90c
Track bolts, Pitts. standard	3.90c to 4.25c
Track bolts, Chicago	3.90c
Tie plates, Chicago, Pittsburgh	2.35c

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra F.o.b. Cleveland and Pittsburgh base.

Wire nails	2.65c
Galvanized nails smaller than 1-inch	4.90c
Galv'd nails, 1-inch and over	4.65c
Plain wire	2.50c
Annealed wire	2.65c
Galvanized wire No. 9 gage	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
Polished staples	3.10c
Galvanized staples	3.35c

Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra card over wire nail base.

Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts. $20.03

Joliet, DeKalb and Waukegan, Ill., and Anderson, Ind., prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh, base	3.10c
No. 24, Philadelphia, delivered	3.42c
No. 24, Gary, Indiana Harbor	3.20c
No. 24, Chicago, delivered	3.25c

TIN MILL, BLACK

No. 28, Pittsburgh	3.25c
No. 28, Gary base	3.35c

GALVANIZED

No. 24, Pittsburgh, base	3.95c
No. 24, Philadelphia, delivered	4.27c
No. 24, Gary, Indiana Harbor	4.05c
No. 24, Chicago, delivered	4.10c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.40c
No. 10, Philadelphia, delivered	2.62c to 2.72c
No. 10, Gary, Indiana Harbor	2.50c
No. 10, Chicago, delivered	2.55c

AUTOMOBILE SHEETS

No. 20, Pittsburgh, base	4.25c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.50

Gary, Ind., base 10 cents higher.

Long ternes, No. 24, base	4.30

*This price is subject to quantity differentials established by individual regulations.

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del. 2½ points less.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	63½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled 3¼ to 3½-inch	46 off

Further discounts of seven 5 per cents allowed for carloads and six 5 per cents for less-carload, on lap welded steel. On seamless hot rolled several more 5 per cents allowed.

Chain, Piling, Cut Nails

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c to 2.30c
Cut nails, c. l., f.o.b. mills	2.80c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$51.20 to 52.20
Six-inch to 24-inch, Chicago	47.20 to 48.20
Over 24-inch, Chicago	45.20
Four-inch, Birmingham	43.00 to 44.00
Six-inch and over, Birming'm	39.00 to 40.00
Four-inch, New York	56.50 to 57.60
Six-inch and over, New York	51.50 to 52.60
Standard fittings, Bir. base	$110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B

Nuts and Bolts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Less-carload lots to consumers and carloads to jobbers. For less-carloads to jobbers and carloads to consumers an extra 5 per cent off applies.

*Hot pressed square tapped or blank	$4.00 off list
*Ditto, hexagon	$4.40 off list
*Cold punched square or hexagon blank	$4.10 off list
*Ditto tapped	$4.10 off list
Cold punched U. S. S. semifinished hexagon nuts ⅝-inch and larger	75, 10 and 5 off
Cold punched U. S. S. semifinished hexagon nuts 9/16-inch and smaller	80, 10 and 5 off
Cold finished S. A. E. semifinished ⅝-inch and larger	75, 10, 10 and 5 off
Cold finished S. A. E. semifinished 9/16-inch and smaller	80, 10, 10 and 5 off

*Add 25 cents per cwt. on less-carloads to jobbers and carloads to consumers.

CARRIAGE BOLTS

(⅜ x 6-inch, smaller and shorter)

Rolled thread	50, 10 and 10 off
Cut thread (all sizes)	50 and 10 off
Eagle carriage bolts (Eagle list)	65 and 10 off

MACHINE BOLTS

(⅜ x 4-inch, hot pressed nuts)

Rolled thread	60 and 10 off
Cut thread	50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread	45 10 and 5 off
Lag screws	60, 10 and 10 off
Plow bolts Nos. 3 and 7 heads	50 and 10 off
All other standard heads	50 and 10 off plus 20 per cent
Tap bolts	30 off
Bolt ends with hot pressed nuts	50, 10 and 10 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)	40 and 10 off

Stove bolts, 80, 10 and 5 off in bulk. In packages, 80, 10 and 5 plus 2½ off.

Tire bolts	60 and 5 off

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000 f.o.b. maker's plant, frt. allowed

	S.AE Castellated	U.S.S. Slotted
¼	$ 4.40	$ 4.40
5/16	5.15	5.15
⅜	6.20	6.60
7/16	7.90	9.00
½	10.10	10.50
9/16	13.80	14.20
⅝	17.00	17.30
¾	28.50	24.00
⅞	36.00	36.00
1	55.50	58.00
1⅛	89.00	89.00
1¼	126.00	131.00
1⅜	183.50	183.50
1½	210.00	210.00

HEXAGON CAP SCREWS

Milled	80 and 10 off
Upset	80, 10 and 10 off

SQUARE HEAD SET SCREWS

Milled	80 and 5 off
Upset	80, 10 and 5 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.50c to 2.60c
Structural rivets, c.l., Chi.	2.60c to 2.75c

**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland, 70, 10 and 5 to 70 and 10 off.

**Rivets, 7/16-inch and smaller, Chicago 70, 10 and 5 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist.	$6.40 to 6.50 off
Wrought c.l., Pitts. dist.	6.75 to 6.50 off
Lock washers, f.o.b. factory	85 to 90 off

Pig Iron

Market Is Easier, as Buying Lags—Melters Anticipate Lower Prices—Inquiry for First Quarter at Low Point

AN EASIER tone is noted in the pig iron markets. Buying has subsided, and some leading furnace interests report the volume of new business booked during the past week as one-fourth to one-third that of the weekly average during the recent buying movement. Consumers not anxious to commit themselves before the inventory period and noting the softer fuel market are anticipating lower pig iron prices for first quarter; furnace companies give this as the main reason for reduced sales. A large merchant producer regards the valley market as $19 to $20, although small sales of foundry and malleable are reported at $20, furnace. The market at Cleveland is softer. The quotation of $23, eastern Pennsylvania furnace has disappeared.

PITTSBURGH, Nov. 23.—Little pig iron is being sold, or sought by melters. Spot sales are negligible, and no inquiries are noted for first quarter. It is understood the recent sale of a fairly large tonnage of basic at $18.50, valley, involved high sulphur iron. Standard basic has sold since at $19. That figure and also $19.50, valley, were quoted on the National Malleable Castings Co.'s inquiry for first quarter. The trade understands Follansbee Bros. Co. recently placed a basic order with its usual source of supply. The bessemer price of $20.50, valley, as quoted last week in IRON TRADE REVIEW has been substantiated further by small sales. One interest sold three lots aggregating around 500 tons. Another disposed of several lots aggregating 900 tons, the largest individual lot being 500 tons. That figure also was quoted the Allegheny Steel Co. on a fairly large quantity. Only filling-in lots of foundry and malleable are noted. These bring $20, valley. One nearby car foundry bought 100 tons of malleable at that figure. The Chateaugay furnace is selling a fairly large tonnage of low phosphorus iron at $24 to $25 furnace. The valley producer is not quoting and is doubtful about starting up Dec. 1 as planned.

Boston, Nov. 23.—Forward buying of pig iron has slowed up and prices are easier. In the week 4000 to 5000 tons were sold for prompt delivery. The Mystic Iron Works is quoting $21.50, base, Everett, Mass. This has been shaded for points with high freight rate.

New York, Nov. 23.—Blast furnace operators and pig iron consumers feel more comfortable about fuel. As a result buying in the past week did not exceed 4000 tons. The only inquiry of size is from Abendroth Bros., Port Chester, N. Y., for 1000 tons for first quarter. The eastern Pennsylvania foundry iron market now is $22.50, base, furnace, and nothing is heard of the $23 price which was asked in some quarters. Buffalo foundry continues at $19, base, furnace, through first quarter.

Buffalo, Nov. 23.—Pig iron sales are small compared with the heavy orders in the preceding three weeks. Inquiry is estimated at less than 5000 tons. Furnaces are getting shipping instructions promptly. A Buffalo furnace that was reported to have quoted 18.50 on large tonnage for outside shipment early in November now is said to be firm at $19. Buffalo district prices range from $20 to $21.

Cleveland, Nov. 23.—Pig iron melters await developments in fuel and the market is not fully tested. An easier trend is noted. Sales the past week by furnace interests with headquarters here were under 15,000 tons, one-third the recent weekly average. In Cleveland business was limited to carloads. The market is not showing a precipitate decline because furnaces have fairly good backlogs for first quarter. Cleveland furnaces quote $20.50, base, furnace, for local delivery and $19.50 for outside. The valley market is $19 to $20, base, furnace. Lake furnaces ask $20, base, for shipment in western Ohio and Indiana and $20.50, base, for delivery in Michigan.

Chicago, Nov. 23.—Estimates place the tonnage of northern iron booked for first quarter in the recent buying at 70 to 75 per cent of aggregate needs. A certain portion is represented in term contracts, so it is difficult to ascertain the tonnage placed. The trend toward lower inventories contributes to a quiet market. Shipments are fully up to those of October. November sales may exceed slightly those of October. The Milwaukee area developed a tonnage, due to the blowing out of the Thomas stacks. Several lots of 2000 tons and more were placed in Illinois and Wisconsin.

Cincinnati, Nov. 23.—While orders for pig iron have been more numerous, the bulk of the business has been taken by lake furnaces. A Cleveland furnace booked an order from Superior Gas Engine Co., Springfield, O., for 1000 tons for first quarter. A melter in central Indiana placed an order with an Ironton, O., producer for 500 tons at $20, furnace. Sales include 300 tons of 7 per cent silvery to a Michigan user and small lots of charcoal. The northern foundry ranges from $20 to $20.50, Ironton, latter quotation applying on prompt shipment. Southern iron is $20, Birmingham.

St. Louis, Nov. 23.—Pig iron selling has dropped to small proportions, melters having covered their needs. From present appearances the carryover of last quarter supplies into the first quarter will be larger than expected. Sales during the past week or ten days totaled about 6000 tons, of which the St. Louis Coke and Iron Corp. booked about 5000 tons, mainly

(*Concluded on Page* 1391)

Pig Iron Prices

Prices per gross ton

Bessemer, valley	$20.50
Bessemer, Pittsburgh	22.26
Basic, valley	19.00 to 19.50
Basic, Pittsburgh	20.76 to 21.26
Basic, Buffalo	19.00 to 19.50
Basic, del., eastern Pa	22.75 to 23.25
Malleable, valley	19.00 to 20.00
Malleable, Pittsburgh	21.76
Malleable, del., Cleveland	21.00
Malleable, Chicago	21.00
Malleable, Buffalo	19.00 to 20.00
Malleable, del., eastern Pa.	24.00 to 24.50
No. IX, Eastern del., Phila	24.76 to 25.13
No. IX, Buffalo	20.50 to 21.00
No. 1 foundry, Chicago	21.50
No. 2 foundry, valley	19.00 to 20.00
No. 2 foundry, Pittsburgh	21.76
No. 2 foundry, Buffalo	19.00 to 20.00
No. 2 foundry, Boston	21.50 to 22.50
No. 2 foundry, Chicago	21.00
No. 2 foundry, Granite City	21.00 to 21.50
No. 2 foundry, Ironton	20.00 to 20.50
No. 2 foundry del., Cleveland	21.00
No. 2 foundry, del., Phila.	23.26 to 24.13
No. 2 foundry, N. J., tidewater	22.28 to 24.76
No. 2X, eastern del., Phila	23.76 to 24.63
No. 2X east N. J., tidewater	22.78 to 25.26
No. 2X, foundry, Buffalo	20.00 to 20.50
No. 2X, eastern del., Boston	25.65 to 26.15
No. 2X, Buffalo, del., Boston	24.41 to 25.41
Continental foundry f.o.b. Boston	21.50 to 22.50
No. 2 Alabama, Birmingham	20.00
No. 2 Alabama, del. Cincinnati	23.69
No. 2 Tenn., Birmingham	20.50
No. 2 Tenn., del. Cincinnati	24.19
No. 2 Alabama, del. Philadelphia	26.01
No. 2 Alabama, del. Chicago	26.01
No. 2 Alabama, del Chicago (barge and rail)	25.18
No. 2 Alabama, del. Boston (rail and water)	26.81
No. 2 Alabama, del. Cleveland	26.01
No. 2 Alabama, del. St. Louis	24.42
No. 2X Virginia	23.00
No. 2X, Virginia, Phila.	28.17
No. 2X, Virginia, del. Jers. City	28.54
No. 2X, Virginia, del., Boston	28.92
Gray forge, eastern Pa	22.75 to 23.25
Gray forge, val. del. Pitts	21.26
Low phos., standard, valley	29.00
Low phos., standard, Phila.	25.76 to 28.29
Low phos., Lebanon	25.00
Charcoal, Birmingham	29.00 to 30.00
Charcoal, Superior, Chicago	27.04

Silvery iron Jackson county, Ohio furnace, 5 per cent $25.50; 6 per cent $26.50; 7 per cent $27.50; 8 per cent $28.50; 9 per cent $30.00; 10 per cent $32.00; 11 per cent $34.00; 12 per cent $36.00; 13 per cent $38.00; and 14 per cent $40.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent $34.00; 11 per cent $36.00; 12 per cent $38.00; 13 per cent $40.00; 14 per cent $42.00; 15 per cent $45.00; 16 per cent $47.00; 17 per cent $49.50.

*Duty paid, delivered Philadelphia consumers. Prices are f.o.b. furnace except where stated otherwise.

Coke

Market Steadier—Reaction to Higher Levels Follows Recent Dip in Beehive Fuel.

THE coke market is steadier, following the recent flurry of uncertainty due to easier conditions in the coal fields. Selling pressure that forced beehive furnace fuel down to $4.25 has been relieved, and $4.50 again is representative minimum. Some leading producers hold to $5 to support the market for first quarter. The market for spot by-product coke is easier.

Pittsburgh, Nov. 23.—While some small lots of beehive furnace coke appeared several days ago at $4.25, now that pressure has been removed from the market the minimum again is $4.50. Some makers asking $5 have difficulty in obtaining that much. Those quoting the maximum as a nominal asking figure apparently wish to lend support to prices around $4.75 for first quarter. Except in a tentative way blast furnaces are not yet inquiring for that period. Some recently bought filling-in tonnages. Market activity is largely confined to nonmetallurgical buyers. Medium sulphur coke is selling at $3.65 to $3.85. Some foundry coke buyers are able to pick up small lots at $5.50. Coal prices still are showing effects of upset market conditions Congestion at the eastern seaboard is throwing much tonnage back on producers, along with several large quantities canceled by payment of $1 per ton penalty. Producers hope to be able to buy later at figures sufficiently low to make such a move profitable. While large operators are maintaining relatively high asking figures, such as $4 for run-of-mine gas coal, sales are noted at $2.50 to $3. Three-quarter inch lump is $3.25 to $3.50 and gas slack $2 to $2.10

Production of coke in the Connellsville region in the week ended Nov. 13 was 140,940 tons, compared with 139.500 tons the preceding week, according to the Connellsville Courier.

Boston. Nov. 23.—Foundry coke is moving freely out of local by-product yards, but spot buying has declined. The price is $13, delivered.

Cincinnati, Nov. 23.—Falling off in demand for coal for tidewater shipment has released the tension in coke. Producers of coke in Wise county and New River districts, are resuming production of coke. Beehive grades are in good demand and prices firm with the Wise county foundry grade quoted at $6 and furnace fuel at $5.50 ovens. New River is firm at $9 for foundry and $6 for furnace. Although producers of by-product foundry fuel have comfortable order books for December they are not contemplating any change in the price of $7.50. ovens, for the Portsmouth grade and $8 for Ashland.

Chicago, Nov. 23.—A few sales of by-product coke have been closed at 50 cents above the quotation of $9.75, Chicago ovens, for contract coke. Inquiry for spot tonnage is light.

St. Louis, 23.—Demand for coke continues brisk, and supplies are scarce. The local by-product manufacturers are operating at capacity. The principal east side producer remains out of the market on all grades except chestnut size. Prices are strong at the recent advances. Users of domestic coke are paying $1.50 to $2 more in the retail market than at this time last year.

Birmingham, Ala., Nov. 22.—Additional contracts are offered Alabama coke producers and all by-product works are in full operation. Independent producers have no surplus and some pig iron makers are calling for stock from independent. Several contracts placed here will warrant steady delivery through the winter. By-product foundry coke remains quotable at $5.50 to $6.

Coke Prices

Beehive, Ovens

Prices per net ton

Connellsville furnace	$4.50 to 5.00
Connellsville foundry	5.50 to 6.00
New River foundry	9.00
New River furnace	6.00
Wise county furnace	5.50
Wise county foundry	6.00
Alabama foundry	5.00 to 6.00

By-Product

Foundry, Newark, N. J.; del.	10.59 to 11.77
Foundry, Chicago, ovens	9.75
Foundry, New England, del.	13.00
Foundry, St. Louis	10.50
Foundry, Granite City, Ill.	10.50
Foundry, Birmingham	5.50 to 6.00
Foundry Indianapolis, del.	10.25
Foundry, Ashland, Ky.	7.50
Foundry, Portsmouth, O.	8.00

Ferroalloys

Users of Ferrosilicon Slow in Closing—Price Holds at $100

Pittsburgh, Nov. 23.—Contracts for 1927 ferrosilicon are being written, but users of ferromanganese show no inclination. They hesitate to sign at $100 while receiving material on $88 contracts. Only a few contracts involving fair size tonnages were written this week by domestic producers for middlewestern consumers at $100, seaboard base, covering first half. No sales of imported material are noted. Additional inquiries are developing and within the next two weeks considerable tonnage will be placed. Consumers of 50 per cent ferrosilicon are practically covered for 1927 at $85, delivered. Users of the 14 per cent grade have signed contracts at $45, f.o.b. furnace. Spiegeleisen for next year is not receiving attention as yet and no spot activity is noted. The high cost for spot fuel forced the spot market on the 19 to 21 per cent spiegeleisen to $40.

New York, Nov. 23.—Now that the ferromanganese price for first half has been established at $100, consumers generally are specifying maximum requirements on 1926 contracts at $88. A good many will have enough such tonnage to satisfy them for one to three months in 1927. Sales for first half at $100 since Nov. 11 have aggregated 20,000 tons. Indications are that the price is firm. The material is to be produced in domestic blast furnaces and in electric furnaces in Norway, and at Welland, Ont. English makers are offering for first half at $100, duty paid, tidewater, but do not appear to have made sales. About 55,000 tons of ferromanganese still is to be closed for first half. The bulk of forward requirements of spiegeleisen remain to be placed. Sales of a number of spot carloads have been made at $40.

Special ferroalloys are under negotiation for next year's needs. The price situation is steady at figures shown in the accompanying table. They are mostly the same as those of a year ago. Tungsten ore, wolframite, is in a strong market, more on account of conditions in Europe and China than here, and asking prices now are $10.75 to $10.85 a short ton unit. Chrome ore is steady, mostly $22.50 to $23.50 a ton, but some New Caledonian sold recently near $25.

Class 1 railroads on Nov. 1 had 8654 locomotives in need of repair or 13.9 per cent of the number on line, according to the American Railway association. This was a decrease of 636 compared with the number in need of repair on Oct. 15, at which time there were 9290 or 14.9 per cent. Serviceable locomotives in storage on Nov. 1 totaled 4102 compared with 4242 on Oct. 15.

Ferroalloy Prices

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand resales	$100.00
Ferromanganese delivered Pittsburgh	104.79
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	40.00
Ferrosilicon, 50 per cent freight allowed	85.00 to 87.50
Ferrotungsten standard, per pound contained	1.02 to 1.05
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, cents per pound contained, delivered	11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.15 to 3.65
Ferro-carbon-titanium, car lots, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent material)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23 to 25 per cent, f.o.b. Anniston, Ala., (24 per cent materials)	122.50

†Duty paid.

Plates

Market Quiet—Orders Placed for Delivery After Inventory Period—Prices Appear Firm

SEASONAL factors are checking new plate business and specifications on present contracts. Desire for low inventories at the close of the year is indicated by many buyers placing orders for delivery early in January. The market is not fully tested, but the price, 1.90c, Pittsburgh, appears firm. About 14,000 tons for oil tanks is pending in the Chicago market.

PLATE PRICES, PAGE 1376

Chicago, Nov. 23.—From 4000 to 5000 tons of plates were booked the past week for oil tankage work, and inquiries for 12,000 to 14,000 tons are outstanding. Several oil fields, notably the Seminole in Okalhoma, are unsatisfied in their requirements for pipe line goods and tankage, and demand is expected to be heavy next year. Oil tankage business this year has kept pace with last year's substantial bookings, the tonnage having been spread more uniformly over 1926. Tonnage is being sold in the Southwest at below 2.10c, Chicago, but producers in this district are firm at 2.10c.

Pittsburgh, Nov. 23.—Despite considerable unoccupied plate capacity no price weakness is apparent; the quottable market remains firm at 1.90c. Eastern mills selling in northwestern Pennsylvania also are adhering to that level. Plate fabricators continue to specify freely. Some recent car and tank lettings have brought business to shops in this locality.

Cleveland, Nov. 23.—Demand for plates continues to shrink perceptibly. Shipments, however, have not declined as rapidly as new buying and the slender backlogs of plate mills are fast being worked off. Some business now being taken is for delivery in the first week of January and it appears that inventories Jan. 1 will be at a record low point. Inquiry for a Great Lakes freighter requiring 5000 tons, mostly plates, has been withdrawn, leaving one 3000-ton boat pending. The Petroleum Iron Works has booked ten 55,000-barrel oil tanks for the Prairie Oil & Gas Co., requiring nearly 2500 tons of plates. The plate price is unchanged at 1.90c, Pittsburgh, or 2.09c, Cleveland, but light buying has precluded a real test.

CONTRACTS PLACED

2500 tons, eight 55,000-barrel oil tanks for Prairie Oil & Gas Co., Seminole, Okla., to Petroleum Iron Works Co.

2000 tons, six special 80,000-barrel tanks for Gulf Refining Co., Port Arthur, Tex., to Petroleum Iron Works Co.

930 tons, three 80,000-barrell tanks, for California Petroleum Corp., Los Angeles, to Western Pipe & Steel Co.

310 tons, one 80,000-barrel tank, Shell Oil Co., Los Angeles, to Llewellyn Iron works.

Shipments of enameled sanitary ware in October, reported by 21 manufacturers to the department of commerce, totaled 387,639 pieces, compared with 412,920 pieces in September and 471,881 pieces in October, 1925. Unfilled orders for baths dropped from 48,278 to 43,556 in the September-October period while total small ware unfilled orders fell from 143,670 to 105,664.

Sheet & Tube Promotes

Youngstown, O., Nov. 23.—Official announcement has just been made by Youngstown Sheet & Tube Co. of several changes among sales department personnel, as well as several promotions by title among department heads. These changes are effective at once.

J. B. Roberts and E. P. Corey, formerly assistant managers of sales, now are assistant general managers of sales. G. F. Holly has been named manager of conduit sales; W. E. Scott now is manager of sheet and plate sales; and G. W. Christopher, formerly district sales agent at Pittsburgh, has been transferred to the home office in charge of wire and bar sales. Arthur Purnell has been transferred from Boston sales office to Pittsburgh as district sales agent; and Fred C. Eggleston has been shifted from the Atlanta office to Boston and made district sales agent.

Germany Ships in Iron

Philadelphia, Nov. 23.—Imports at this port in the week ending Nov. 20 included 9000 tons of pig iron from Germany and 100 tons from the Netherlands. From Portuguese East Africa 3245 tons of chrome ore were received. France shipped 609 tons of blooms and 24 tons of cast iron pipe. Fourteen tons of steel bands and 14 tons of round bars were sent in from Belgium.

Semifinished

Specifications Slower in Developing — Market Shows Quieter Trend—Prices Steady

SEMIFINISHED steel is not being consumed on so large a scale as in the fall months, specifications having slowed up to an extent that mill operations have been reduced in some instances. Demand for sheet bars has fallen off, due particularly to lower consumption of sheets in the automotive industry. Some improvement is expected in December.

SEMIFINISHED STEEL PRICES, PAGE 1376

Pittsburgh, Nov. 23.—Several small orders for semifinished steel came to mills here last week. Two or three sheet bar specifications each involved 300 to 400 tons, and smaller specifications for billets and slabs were noted. A few inquiries have been received for December tonnage. Quoted prices are firm, namely $36 on sheet bars and $35 on billets and slabs. Some makers are commencing to talk about advancing prices for first quarter. Wire rods are quiet, some specifications being held up. Skelp is inactive.

Cleveland, Nov. 23.—Specifications for semifinished material, especially sheet bars, have declined considerably. The leading merchant mill interest here has reduced its active open hearths from 12 to eight, but expects to increase operations about the middle of December. New demand is light; prices are steady.

A ton of Pittsburgh high-volatile coal coked in a by-product oven will yield approximately 11,000 cubic feet of coal gas with a heating value of about 585 B.t.u. per cubic foot.

Receiver Is Named for Youngstown Car

Youngstown, O., Nov. 23.—The Dollar Savings & Trust Co. has been appointed receiver for the Youngstown Steel Car Co., which has a car repair and building plant near Niles. The car company, in which Youngstown Sheet & Tube Co. is interested, incurred a deficit of more than $600,000 and receivership was asked to conserve assets for the creditors. The company was organized by William Wilkoff about eight years ago. He resigned the presidency recently and Frank Purnell, assistant president of the Sheet and Tube company, was placed in charge. The plant, it is believed, will be sold soon.

As late as 1850 there were more pig iron and scrap iron forges in Pennsylvania than rolling mills.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross Tons Delivered to Consumer

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	13.00 to 13.50
Boston (dealers)	10.50 to 11.00
Buffalo, No. 1	17.00 to 17.50
Buffalo, No. 2	15.50 to 16.00
Chicago	13.00 to 13.50
Cincinnati (dealers)	12.75 to 13.50
Cleveland, No. 1	14.50 to 15.00
Cleveland, No. 2	14.00 to 14.50
Detroit	11.75 to 12.25
Eastern Pennsylvania	15.50 to 16.00
Bethlehem delivery	15.50 to 16.00
New York (dealers) (yard)	9.25 to 9.75
Pittsburgh No. 1	17.00 to 17.50
Pittsburgh No. 2	16.00 to 16.50
St. Louis	13.00 to 13.50
Valleys, No. 1	16.00 to 16.50

COMPRESSED SHEETS

Buffalo	15.25 to 15.75
Chicago	11.50 to 12.00
Cleveland	13.00 to 14.00
Detroit	11.00 to 11.75
Pittsburgh	15.50 to 16.00
Valleys	15.00 to 15.50

BUNDLED SHEETS

Buffalo	11.00 to 11.50
Cincinnati (dealers)	9.50 to 10.00
Cleveland	12.50 to 13.00
Eastern Pennsylvania	13.00 to 13.50
Pittsburgh	14.50 to 15.00
St. Louis	8.00 to 8.50

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	6.50 to 7.00
Detroit	6.25 to 6.75
St. Louis	7.00 to 7.50

STEEL RAILS, SHORT

Birmingham	12.50 to 13.50
Buffalo	17.25 to 17.75
Chicago	16.75 to 17.00
Cincinnati (dealers)	17.50 to 18.00
Cleveland (over 6 ft.)	14.75 to 15.00
Detroit	13.00 to 14.00
St. Louis	16.50 to 17.00

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	13.00 to 13.50
Buffalo	14.50 to 15.00
Chicago (net)	14.00 to 14.50
Cincinnati (dealers) (net)	9.00 to 9.50
Cleveland	13.00 to 13.50
Detroit (net tons)	12.00 to 12.50
Eastern Pennsylvania	13.00
New York (dealers)	10.00 to 11.25
Pittsburgh	13.00 to 13.50
St. Louis	14.75 to 15.25

LOW PHOSPHORUS

Buffalo, billet and bloom crops	18.00 to 18.50
Cincinnati (dealers)	16.50 to 17.00
Eastern Pennsylvania	19.00 to 20.00
Pitts. billet and bloom crops	20.00 to 20.50
Cleveland, billet and bloom crops	19.00 to 19.50

SHOVELING STEEL

Chicago	13.00 to 13.25
Pittsburgh	12.50 to 13.00
St. Louis	13.00 to 13.50

KNUCKLES, COUPLERS, SPRINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	17.00 to 18.00
Pittsburgh	18.00 to 18.50
St. Louis	14.00 to 14.50

FROGS, SWITCHES, GUARDS

Chicago	15.00 to 15.50
Eastern Pennsylvania	12.00 to 12.50
St. Louis	14.00 to 14.50

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	15.25 to 15.75
St. Louis	13.75 to 14.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	12.00 to 12.50
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	15.00 to 15.50
Chicago, No. 1	14.50 to 14.75
Chicago, No. 2	13.00 to 13.50
Cincinnati, No. 1 (dealers)	11.50 to 12.00
Cleveland, No. 1	12.50 to 13.00
Eastern Pennsylvania	17.00 to 17.50
New York, No. 1 (dealers)	14.50 to 15.00
Pittsburgh, No. 1	13.00 to 13.50
Pittsburgh, No. 2	17.00 to 17.50
St. Louis, No. 1	13.00 to 13.50
St. Louis, No. 2	13.00 to 13.50

WROUGHT PIPE

Boston (dealers)	9.00 to 9.50
Eastern Pennsylvania	14.00 to 14.50
Buffalo	15.00 to 15.50
New York (dealers)	9.25 to 9.75

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	13.50 to 14.50

BUSHELING

Buffalo	15.25 to 15.75
Chicago, No. 1	11.50 to 12.00
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	8.00 to 8.50
Cleveland No. 1	11.75 to 12.00
Cleveland, No. 2	11.50 to 11.75
Pittsburgh, No. 1	14.50 to 15.00
St. Louis, No. 1	11.50 to 12.00

MACHINE SHOP TURNINGS

Birmingham	8.00 to 8.50
Boston	8.00 to 8.50
Buffalo	11.75 to 12.25
Chicago	7.25 to 7.75
Cincinnati (dealers)	6.00 to 6.50
Cleveland	11.00 to 11.50
Detroit	7.75 to 8.25
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	9.25 to 9.75
Pittsburgh	11.50 to 12.00
St. Louis	7.00 to 7.50

CAST IRON BORINGS

Birmingham (chemical)	15.50 to 16.50
Birmingham (plain)	8.00 to 8.50
Boston (chemical)	10.50 to 11.00
Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Chicago	9.50 to 10.00
Cincinnati (dealers)	6.50 to 7.00
Cleveland	11.75 to 12.00
Detroit	8.75 to 9.25
Eastern Pennsylvania	13.00 to 13.50
Eastern Pennsylvania (chem.)	15.50 to 16.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00
St. Louis	10.50 to 11.00
Valleys	13.50

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Cincinnati (dealers)	6.00 to 6.50
Cleveland	11.75 to 12.00
Detroit	8.50 to 9.00
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00

PIPES AND FLUES

Chicago (net)	8.25 to 8.75
Cincinnati (dealers)	8.00 to 8.50
St. Louis	10.00 to 10.50

RAILROAD GRATE BARS

Buffalo	13.00 to 13.50
Chicago (net)	13.25 to 13.75
Cleveland	13.50 to 13.75
Eastern Pennsylvania	13.00
New York (dealers)	11.25 to 12.00
St. Louis	14.75 to 15.00

FORGE FLASHINGS

Boston (dealers)	8.50 to 9.00
Buffalo	13.00 to 13.50
Chicago	9.25 to 9.75
Cleveland (over 10 in.)	12.50 to 13.00
Cleveland (under 10 in.)	12.50 to 13.00
Detroit	8.25 to 8.75
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	8.50 to 9.00
Chicago	17.00 to 17.50
Eastern Pennsylvania	13.50 to 14.00

ARCH BARS AND TRANSOMS

Chicago (net)	19.00 to 19.25
St. Louis	20.00 to 20.50

Iron Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	9.50 to 10.00
Buffalo	13.50 to 14.00
Chicago	13.25 to 13.75
Cleveland	12.50 to 13.00
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	15.00 to 15.50
St. Louis	10.50 to 11.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	18.00 to 18.50
Buffalo	16.50 to 17.00
Chicago	18.50 to 19.00
Cleveland	16.00 to 16.50
Eastern Pennsylvania	22.00 to 23.00
Pittsburgh	20.00 to 21.00
St. Louis	19.50 to 20.00

SHAFTING

Boston (shipping point)	16.00 to 17.00
Chicago	18.50 to 19.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	17.50 to 18.00
St. Louis	18.00 to 18.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	15.00 to 16.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	16.00 to 16.50
Buffalo, steel	17.00 to 17.50
Chicago, iron	14.75 to 15.25
Chicago, steel	16.50 to 17.00
Cincinnati	12.00 to 12.50
Eastern Pennsylvania	16.50 to 17.00
New York iron (dealers)	12.50 to 13.50
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	18.50 to 19.00
St. Louis, iron	14.00 to 14.50
St. Louis, steel	17.00 to 17.50

NO. 1 CAST SCRAP

Birmingham, cupola	16.00 to 17.00
Boston	18.00 to 18.50
Buffalo	15.25 to 15.75
Chicago, No. 1 machinery	18.50 to 19.00
Chicago, No. 1 railroad or agricultural	17.50 to 18.00
Cincinnati No. 1 machinery cupola (net tons dealers)	17.50 to 18.00
Cleveland, cupola	16.75 to 17.25
Detroit (net tons	14.25 to 14.75
Eastern Pennsylvania, cupola	17.00 to 17.50
New York, cupola (dealers)	14.50 to 15.00
Pittsburgh, cupola	16.00 to 16.50
San Francisco, delivered	20.00 to 21.00
Seattle	16.50
St. Louis, railroad	16.50 to 17.00
St. Louis, agricultural	16.00 to 16.50
St. Louis, machinery	19.00 to 19.50
Valleys	17.50

HEAVY CAST

Boston	15.50 to 16.00
Buffalo (breakable)	13.25 to 13.75
Cleveland	13.00 to 13.25
Detroit (automobile) (net tons)	15.00 to 16.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.75 to 13.50
Pittsburgh	15.00 to 15.50

MALLEABLE

Boston, railroad	19.50 to 20.00
Buffalo	17.50 to 18.00
Chicago, agricultural	15.25 to 15.75
Chicago, railroad	16.50 to 17.00
Cincinnati, railroad (dealers)	14.50 to 15.00
Cincinnati, agricultural (dealers)	14.50 to 15.00
Cleveland, agricultural	17.50 to 18.00
Cleveland, railroad	18.50 to 19.00
Detroit	14.00 to 14.50
Eastern Pennsylvania, railroad	14.00 to 15.00
Pittsburgh, railroad	17.00 to 17.50
St. Louis, agricultural	13.00 to 13.50
St. Louis, railroad	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	14.00 to 15.00
Boston (dealers)	12.00 to 12.50
Buffalo	17.25 to 17.75
Chicago	16.50 to 17.00
Cleveland	16.00 to 16.25
Eastern Pennsylvania	17.00 to 17.50
New York	13.75 to 14.25
Pittsburgh district	18.00 to 19.00
St. Louis	15.25 to 15.75

LOCOMOTIVE TIRES

Chicago, No. 1	17.75 to 18.00
Chicago, cut	17.00 to 17.50
St. Louis, No. 1	16.25 to 16.75

LOW PHOSPHORUS PUNCHINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh	18.00 to 19.00

Scrap

Some Revival of Interest Appears—Opinions Differ on Future of Market

VARYING currents seem to be getting under way in the market for iron and steel scrap. On the surface these give little indication of the real trend, but any accession of interest is of value, compared with the sluggish situation. Some advances have been made and some selling is appearing. Dealers are taking more active position in some localities.

Chicago, Nov. 23.—Sentiment on iron and steel scrap prices is split sharply. One group holds to present levels while the other believes prices should be advanced. Consumer interest has been stirred a trifle, but not sufficiently, in the opinion of a number of dealers, to sustain a higher market. Mills are using more scrap in their open hearths, but have good supplies. One mill has been in the market for heavy melting steel but has offered no more than $13.50. Cast borings have picked up in dealer transactions, resulting in asking prices of $9 to $9.50. Production is light, one automotive works having reduced its shipments sharply.

Boston, Nov. 23.—Heavy tonnages of steel scrap are being offered by railroads and other large producers. The Boston Elevated has a list of miscellaneous scrap totaling 750 tons. Heavy steel is still sluggish at $11 to $11.50, shipping point.

New York, Nov. 23.—The immediate outlook in scrap is not promising. Some dealers are wondering if acceptance of certain business at 50 cents under the current market now offered would not look good a month or two months hence. In most instances consumers are fairly well stocked, and at the same time their operations are off.

Philadelphia, Nov. 23.—In the absence of consumer buying to any degree further declines in scrap prices have taken place in the past week.

Buffalo, Nov. 23.—Scrap prices continue to show nominal declines, although the new quotations have not been confirmed by tonnage transactions in most instances. Unfilled contracts and light receipts are holding heavy melting steel steady.

Pittsburgh, Nov. 23.—Scrap is dull. An Ohio consumer purchased a large quantity of high grade heavy melting steel scrap. It is understood to have started its bids at $18 and this brought out so much tonnage that it finally was able to gather in some as low as $17.25. The market, therefore, still remains quotable at $17 to $17.50 and some lower grade is available at $1 less. A limited tonnage sale of iron car wheels brought $16.50.

Detroit, Nov. 23.—Demand for iron and steel scrap continues limited. Orders are few and small. Dealers continue to buy cautiously and only for immediate requirements.

Cleveland, Nov. 23.—Melters of iron and steel scrap continue their listless attitude toward the market and no selling is being done. Some blast furnace scrap is being delivered but melting steel is a drug. Some tonnage is being diverted to the valleys.

Cincinnati, Nov. 23.—Cancellation of shipments on contracts is more pronounced with consumers than for months because mills are getting little new business and have sufficient stocks to meet immediate requirements. Weakness has appeared and several dealers have reduced their buying prices 50 cents a ton.

St. Louis, Nov. 23.—While buying of iron and steel scrap has failed to appear, sentiment is slightly better among sellers, and with the exception of three or four items, prices held steadv. The improved psychology is based almost entirely upon prospects for the placement of equipment orders by railroads.

Railroad offerings were smaller than for several weeks, consisting of the following lists: Baltimore & Ohio, 150 tons of bridge scrap; Frisco, 750 tons and 500 tons of car wheels; Clover Leaf, 250 tons; Cotton Belt, 1100 tons and Chicago Belt, 600 tons.

Birmingham, Ala. Nov. 22.—Deliveries of old material are active, a few sales are still being made and quotations being readjusted only as to the range. Heavy melting steel is being used in quantity but no new purchases have been made recently.

Sheets

Inventory Season Slows Down Shipments — Motorcar Builder Testing Market for Black Sheets

THE sheet market generally presents a quieter appearance, largely due to the approach of inventory time. While some valley mills this week are operating practically at full capacity, others are at 50 per cent, or idle. Pittsburgh mills are receiving normal specifications, and report an increase in releases from the automotive industry.

SHEET PRICES, PAGE 1376

Pittsburgh, Nov. 23.—The majority of sheet specifications are normal, and in a few instances better than normal. Business is much diversified. Releases on automobile sheets are increasing. Automobile manufacturers' schedules for next month will be much better than for November. Low inventories are being maintained everywhere. While a number of customers are buying on a month-to-month basis, others are contracting for the entire first quarter. Prices are steady. An inquiry for galvanized sheets here developed the fact that deliveries were five to seven weeks deferred. The sheet industry is operating at approximately 80 per cent, considered high for this season.

Boston, Nov. 23.—Sheet buying for first quarter is listless. The price asked is 3.95c, Pittsburgh, for galvanized and 3.10c for black.

New York, Nov. 23.—An order for 200 tons of electrical sheets for the Shibaura Engineering Co., Japan, has been placed by Mitsui & Co. with the American Rolling Mill Co.

Buffalo, Nov. 23.—Sheet business is quiet but first quarter specifications indicate increased purchasing soon. Most mills announced a base price of 3.10c on black sheets but reports of slightly lower quotations by some makers persist. Makers say users of heavy gages are profiting by the new base and are disposed to close for first quarter. Mill operation is estimated at 65 per cent.

Chicago, Nov. 23.—Opening of first quarter books for sheets fails to bring out forward buying, but specifications against fourth quarter contracts are satisfactory. Spot sales are at a minimum. Present quotations are expected to apply for first quarter.

Youngstown, O., Nov. 23.—Continued slow buying by sheet consumers is resulting in gradual reduction in mill schedules. While some important sheet plants are running at 100 per cent with order books filled for three weeks ahead, others are operating at 45 per cent. Others did not start the week until Tuesday, and still others are idle this week. Quotations are firm at 3.10c for black; 3.95c for galvanized; 2.40c for blue annealed and 4.25c for full-finished. A good tonnage of black sheets to be placed at Detroit today by a large automobile builder is expected to bring out significant market signs. Valley mills do not expect many orders until consumers' inventory taking has been completed.

Philadelphia, Nov. 23.—Aside from some first quarter contracting for blue annealed, black and galvanized sheets, at full prices, the market is slower. New bookings for this year

are small because consumers are under contract.

Cleveland, Nov. 23.—General manufacturing demand for sheets continues at a good rate. New business is spotty but specifications against fourth quarter contracts are fair. Price steadiness is aided by the lack of attractive new business such as barrel stock inquiries. Black sheets are holding at 3.10c, Pittsburgh. Blue annealed sheets range from 2.30c to 2.40c, with much of the new business taking the maximum. Galvanized at 3.85c to 3.95c also is steady. Not much demand exists for autobody sheets, which are quoted at 4.25c.

Tractor Shipments Gain

Washington, Nov. 23.—Shipments of electric industrial trucks and tractors in October totaled 134, compared with 97 in September, according to returns to the department of commerce from nine manufacturers. Other comparisons follow:

1925	Tractors	Domestic All other types	Exports
Quarter ending March 31	45	259	41
Quarter ending June 30	49	280	50
Quarter ending Sept. 30	57	286	12
Quarter ending Dec. 31	41	295	25
1925 Total	192	1,120	128
1926			
Quarter ending March 31	44	310	17
Quarter ending June 30	50	281	32
Quarter ending Sept. 30	39	258	8
January, 1926	21	86	4
February	15	96	5
March	11	128	8
April	17	90	4
May	12	87	9
June	21	104	19
July	15	95	1
August	14	81	2
September	10	82	5
October	18	98	18

Babbitt Sales Smaller

Washington, Nov. 23.—Total apparent consumption of babbitt metal in October, based on reports of 27 manufacturers to the department of commerce, was 4,868,053 pounds, the lightest month, with the exception of May, since September, 1925. Sales by manufacturers totaled 3,529,081 pounds and consumption by producers, 1,338,972 pounds. Further comparisons follow:

1925	Total apparent consumption	Sales by manufacturers	Consumption by producers
October	5,550,247	4,169,870	1,380,377
Total (10 mos.)	52,572,439	40,835,617	11,736,822
November	4,954,683	3,534,026	1,420,657
December	4,878,806	3,910,160	968,646
Totals	62,405,928	48,279,803	14,126,125
1926			
January	5,162,694	3,708,383	1,444,311
February	5,139,952	3,867,710	1,272,242
March	5,860,453	4,852,805	1,007,738
April	5,229,199	3,817,253	1,411,946
May	4,797,038	3,640,369	1,156,669
June	4,963,975	3,633,211	1,380,284
July	5,015,464	3,676,664	1,338,800
August	4,986,825	3,632,920	1,353,905
September	5,337,032	3,854,702	1,482,330
October	4,868,053	3,529,081	1,338,972
Total (10 mos.)..	51,350,775	38,213,578	13,137,197

October shipments of fire extinguishing equipment, as reported to the department of commerce by practically all manufacturers in the industry, totaled 149 pieces of motor apparatus, and 44,269 of hand types, compared with 134 motor and 48,517 hand types in September.

Tin Plate

Large Users Closing for First Half—Shading Noted

TIN PLATE PRICES, PAGE 1376

Pittsburgh, Nov. 23.—Contracts for first half requirements of tin plate for large canmakers, including Continental Can Co., are being written. While American Sheet & Tin Plate Co. is engaged on a part of American Can Co's requirements, final details of this business involving about 5,000,000 base boxes, will be arranged this week. The leading interest is operating at 92 per cent of capacity, and this will be increased to 97½ per cent by Dec. 1. Independents are averaging 90 per cent. The quoted price is $5.50 but this has been shaded for some preferred customers.

New York, Nov. 23.—Advices from Japan state that the Nippon Oil Co. will come into the market about the end of November for its first quarter tin plate requirement.

Adds Coking Capacity

Trumbull Cliffs Furnace Co., Warren, O. will increase its coking capacity about 35 per cent. Contract for the erection of 17 additional double ovens of the Koppers type has been let and work will start next week. The company now has 47 by-product ovens with an annual rated capacity of 290,000 net tons of coke. By-products largely are used by the Trumbull Steel Co., which owns the furnace property jointly with Cleveland Cliffs Co.

Pipe

Mill Operating Rate Slightly Lower—Cast Makers Await Opening of Spring Inquiries

TUBULAR products makers continue to operate at fairly good rates, although slightly lower than in preceding weeks. Jobber buying is lighter as new building operations decrease and inventory season approaches. Cast iron pipemakers find the dull season approaching and await formulation of municipal and private requirements for spring delivery.

PIPE PRICES, PAGE 1376 AND 1410

Pittsburgh, Nov. 23.—Several pipe manufacturers in this territory as well as in the Wheeling and Youngstown, districts continue to maintain practically full operation. The average is about 95 per cent but at every plant practically all the time one furnace is out for repairs so that the operating basis of the entire industry can be said to be full. The National Tube Co., the Spang-Chalfant Co., the Jones & Laughlin Steel Corp., the Youngstown Sheet & Tube Co. and Republic Iron & Steel Co. all have good backlogs but recent heavy shipments make it possible to give better delivery promises. No large line pipe inquiries are pending, although some are being tentatively projected in Oklahoma and Texas. Jobbers orders are small but fairly numerous. Prices are firm.

Chicago, Nov. 23.—The bulk of current cast iron pipe sales are at $39 to $40, Birmingham, or $47.20 to $48.20, delivered Chicago, for 6 to 24-inch sizes. Sales and shipments still balance. Buying for spring delivery is several weeks off. Deliveries on many sizes can be made in three to six weeks.

Birmingham, Ala., Nov. 22.—Cast iron pressure pipe production is unchanged although, new business is not as voluminous as previously. Prices hold at $39 to $40 for 6-inch and over sizes. Soil pipe and fittings and specialty pipe are in a lagging market and production has been curtailed.

New York, Nov. 23.—Municipal demand is at low ebb in eastern cast pipe market, but a sustaining influence is improved inquiry from private companies. Prices are holding fairly steady, except those on some of the larger sizes.

CONTRACTS PLACED

2200 tons, 6-inch pipe for Detroit, to United States Cast Iron Pipe & Foundry Co.

1100 tons, 6 to 12-inch pipe for Mt. Prospect, Ill., to Henry Rees & Son.

500 tons, 18-inch class B pipe, for South San Francisco Water Co., San Francisco, to Grinnell Co. for Belgian pipe.

350 tons, 12-inch pipe for Mansfield, O., to Central Foundry Co.

281 tons, 16-inch class B, Huntington Park, Calif., to Grinnell Co. for Belgian pipe.

215 tons, 6 to 12-inch class B, Medford, Oreg., to American Cast Iron Pipe Co.

100 tons, 16-inch class B, Medford, Oreg., to United States Cast Iron Pipe & Foundry Co.

100 tons, 6-inch pipe for Royal Oak, Mich., to Detroit Lead Pipe Co., jobber, pipe to be furnished by Alabama Pipe Co.

CONTRACTS PENDING

30,000 feet of 10-inch cast pipe, Madison, N. J.; bids opened Nov. 22.

1770 tons, 4 to 8-inch class B and C, Los Angeles; bids opened.

600 tons, 6 to 10-inch pipe for North Riverside, Ill.; bids in.

331 tons, 4 to 8-inch class B, Fairfield, Calif.; bids will be called for next month.
300 tons, 6-inch pipe for Morton Grove, Ill.; bids being received.
258 tons, 2 to 8-inch pipe, San Luis Obispo, Calif.; bids in Dec. 6.
200 tons, 6-inch pipe for Glenview, Ill.; pending.

Iron Ore

Demand Quiet—Amount on Hand Less Than Last Year

Cleveland, Nov. 23.—The market for Lake Superior iron ore is quiet, with a few miscellaneous inquiries for small tonnages pending. The movement of ore by vessel is slowing up due to unfavorable weather in the northern lakes. Ore at furnaces and lower lake docks Nov. 1 was 800,000 tons less than a year ago, as the following report of consumption and balances by the Lake Superior Iron Ore association indicates:

	Tons
Ore consumed in September	4,737,812
Ore consumed in October	4,947,539
Increase in October	209,727
Ore consumed in October, 1925	4,609,389
Ore at furnaces Nov. 1, 1926	34,407,147
Ore on Lake Erie docks, Nov. 1, 1926	7,596,568
Total at furnaces and Lake Erie docks Nov. 1, 1926	42,003,715
Total, Nov. 1, 1925	41,197,798

Structural Steel Sales React in October

Washington, Nov. 23.—Sales of fabricated structural steel in October totaled 204,350 tons, an increase over September, but far behind October, 1925, according to reports to the department of commerce. In October, 170 companies reported bookings of 171,229 tons, or 67 per cent of capacity, with shipments 253,150 tons or 83 per cent. The following data is based on reports of 203 companies, including data in early months by 21 fabricators now out of business. For comparative purposes the percentage figures are used to obtain a computed total for the United States, based on a capacity of 285,000 tons per month in 1923, 293,000 tons in 1924, and 305,000 tons in 1925 and 1926.

1925	Actual tonnage	Per cent of capacity	Computed tonnage	Shipments computed
Total (10 mo.)	.....	....	2,263,100	2,287,500
Oct.	239,680	89	271,450	268,400
Nov.	191,170	71	216,550	225,700
Dec.	200,147	74	225,700	240,950
Total (12 mos.)			2,706,350	2,754,150
1926				
Jan.	161,414	59	179,950	207,400
Feb.	163,350	60	183,000	192,150
March	184,139	68	207,400	250,100
April	196,457	73	222,650	244,000
May	206,674	76	231,800	237,900
June	203,040	75	228,750	268,400
July	191,694	71	216,550	268,400
Aug.	*222,258	82	250,100	250,100
Sept.	†161,944	60	183,000	253,150
Oct.	171,229	67	204,350	253,150
Total (10 mo.)	.....	....	2,107,550	2,424,750

*Reported by 196 firms with a capacity of 270,305 tons.
†Reported by 190 firms with a capacity of 267,930 tons.
‡Reported by 170 firms with a capacity of 256,730 tons.

Bars

First Quarter Buying Started But Little Is Sold—Price Is in Question

BOOKS have been opened by producers for first quarter steel bars but consumers have not placed much business. An independent mill at Chicago has continued 2.10c, mill, for that delivery, but that figure is being contested. Specifications have been increased somewhat and present production is gaining over the past month. Prices are firm for spot delivery.

BAR PRICES, PAGE 1376

Chicago, Nov. 23.—First quarter order books for bars, plates and shapes are being opened by a leading independent producer on the basis of 2.10c, Chicago. This quotation is subjected to resistance by larger finished steel buyers, who are not ready to occupy themselves with forward commitments. While farm implement makers are uncertain as to the vigor of spring business, reports from automotive works indicate more optimism from that field. Automotive specifications for finished steel and specifications from parts makers for hot rolled strip are gaining, and December schedules placed with a leading mill call for an increase of 15 to 20 per cent over November.

Automotive parts makers also are planning heavy schedules for January. Road machinery builders, with heavy programs, are helping to fill the gap in soft steel bar buying occasioned by relaxed implement and automotive demand. Manufacturing demand for bars shows no marked slump. While bar specifications from all sources are only slightly behind shipments, pressure for shipments is less spirited and the rate has declined from a month ago. Bar buying, while behind that of October, is holding close to shipments. Iron bar demand is quiet, but specifications for alloy steel bars are stronger and production is increasing.

Boston, Nov. 23.—Bar sales are encouraging and leading interests find the week's total above the average for the year. Alloy bar sales of the week total close to $100,000. The price range is from 2.265c to 2.365c, delivered.

Buffalo, Nov. 23.—Bar demand is not improved and mills are running only a week or ten days ahead of orders. Production is 60 to 65 per cent of capacity. The 2.265c price can be had by large buyers for fourth or first quarter, according to reports, although some sellers have a nominal 2.365c base.

Pittsburgh, Nov. 23.—A start has been made in soliciting first quarter merchant steel bar business. Most buyers, however, are in no hurry to commit themselves and contracts so far have been negligible. Several makers have not started as yet and continue to sell for delivery this year at 2.00c, small lots bringing 2.10c. Specifications have been slightly accelerated the past week, some automotive tonnage being released through cold finishers. On the whole the market still is dull, but no more than usual at this time of the year.

Occasional lots of refined iron bars are purchased, but small orders rule. Customers all maintain low inventories and occasional concessions under the 3.00c minimum have been noted.

Philadelphia, Nov. 23.—Steel bar specifications are only slightly below October, comparing favorably with most other finished lines. Considerable first quarter contracting has been done at 2.00c, Pittsburgh.

Cleveland, Nov. 23.—Soft steel bar inventories of most consumers here Jan. 1 promise to be the lightest on record. Some bar business now being taken is for delivery early in January. Demand for bars has shrunk vertically and with several producers new business thus far in November has been 50 per cent less than in October. The trend in automobile production and consequent bar demand continues downward. Local producers quote 2.00c, Cleveland, on bars and are understood to have gone below on attractive business. Other sellers adhere generally to 2.00c, Pittsburgh, or 2.19c, Cleveland.

Youngstown, O., Nov. 23.—Steel bar demand continues slow and important makers have knocked off certain size mills for lack of orders. Business is largely covered by contracts and shipments have been fairly satisfactory. Bars are quoted at 2.10c for average buyers while desirable lots are bringing 2.00c, Pittsburgh.

Hoops and Bands

Market Fairly Active with Releases Being Made

HOOP PRICES, PAGE 1376

Pittsburgh, Nov. 23.—Hoop and band sizes of hot strips again are fairly active, with some releases. A few producers are negotiating with regular customers for next quarter contracts but are unable to stir up much interest. The market is firm at 2.50c.

Bearium Bearing, Buffalo, has increased capital from 4500 to 10,400 shares no par value.

Structural Shapes

Inquiry Improving in East, But Awards Continue Small and Scattered—First Quarter Contracting Being Negotiated

STRUCTURAL steel contracting is varying little, although in the eastern territory, supplied by New York fabricators, a decided improvement is noted in new inquiries. Awards continue mostly small and scattered, being featured during the past week by the closing of 5000 tons for Hotel Schroeder, Milwaukee, and 10,000 tons for theaters in Detroit, St. Louis and Brooklyn, N. Y. Some first quarter negotiations have been inaugurated, and several eastern makers have opened their books at present prices for such delivery. Fabricators in the Chicago district continue well booked, with 60 to 90-day backlogs in some cases. No marked change in prices is noted, with plain material quotations generally holding firm.

STRUCTURAL SHAPE PRICES, PAGE 1376

New York, Nov. 23.—Structural buying has shown little gain but inquiry has undergone a substantial improvement. Few large tonnages are noted, but specifications are more numerous. Most fabricating shops have sufficient business to cover them over the remainder of the year. No marked easing off in the trend of fabricating material prices is noted. Plain material prices also are fairly steady, with the great bulk of business going at 1.90c to 2.00c, Pittsburgh.

Shape mills are reporting more first quarter inquiry and some have opened their books to this business at present prices.

Boston, Nov. 23.—Steel construction shows better activity. Contracts while mostly small have shown a better total than in many weeks. Phoenix Bridge Co. took a contract for 2000 tons for a bridge across the Charles river. Plain material holds from 1.90c to 2.00c.

Pittsburgh, Nov. 23.—Structural shape awards appear to be confined to small lots although a number of inquiries, attractive from the tonnage standpoint, are said to be pending here. Some fabricating shops have been approached with first quarter contracts but they are in no hurry to sign up for that period. The price continues strong and unchanged at 2.00c for plain material.

Cincinnati, Nov. 23.—Movement of structural material continues on a fair scale, although individual orders are not large. This is attributed to the fact railroad inquiry is light and fabricators are buying only to fill orders on their books. Several projects are pending, which will require large tonnages. Among these is the addition to the Union Central Life Insurance building, which will take between 2000 and 2500 tons. Plain material prices are steady at 2.10c, Cincinnati, or 2.00c, Pittsburgh.

Chicago, Nov. 23.—Larger structural shops are booked 60 to 90 days on pending projects and are specifying steadily from the mills. A leading structural mill reports bookings for the past five weeks up to the normal average for the year. Specifications for plain material in the district have not varied by more than 10 per cent in any week during the year, fabricators report. Mills report users of finished steel are working toward the lowest inventories this season than probably ever before.

Milwaukee, Nov. 23.—One of the largest contracts for structural steel ever placed in Milwaukee for a local building project was let to the Worden-Allen Co. for the framework of the new Hotel Schroeder at Grand avenue and Fifth street. The steel required totals 4700 to 5000 tons.

Philadelphia, Nov. 23.—Quiet shape demand recently has resulted in reduced mill schedules. In a number of cases these are insufficient to engage full capacity. Prices continue 1.85c to 2.00c, Pittsburgh.

Cleveland, Nov. 23.—Award of 10,000 tons for theater and office buildings for Fox Films Corp. at Detroit, Brooklyn, N. Y., and St. Louis features structural activity of this district, the contract going to the local McClintic-Marshall Co. office. Other structural projects of size are few and small lots alone are being placed. Plain material prices hold steady at 2.19c, Cleveland.

Awards Compared

	Tons
Awards this week	36,405
Awards last week	31,900
Awards two weeks ago	20,827
Awards this week in 1925	19,230
Average weekly awards, Oct.	21,312
Average weekly awards, 1926	27,916
Total awards to date, 1925	1,570,900
Total awards to date, 1926	1,320,528

CONTRACTS PLACED

10,000 tons, 5000 tons for theater and office building at Detroit, and 5000 tons for similar buildings at St. Louis and Brooklyn, N. Y., for Fox Films Corp., through Aronberg-Fried Co., general contractors, to McClintic-Marshall Co.

5000 tons, Hotel Schroeder, Milwaukee, to Worden-Allen Co. Holabird & Roche, Chicago, architects.

4000 tons, central police station and municipal building, Chicago, to American Bridge Co.

2500 tons, school, Wilkes-Barre, Pa., to McClintic-Marshall Co.

2000 tons, Cottage Farms bridge, Boston, to Phoenix Bridge Co.

1500 tons, four apartments and a factory, New York, to a local fabricator.

1450 tons, two apartments, New York, to Harris Structural Steel Co.

1300 tons, subway car repair shops, Lenox avenue and 148th street, New York, to American Bridge Co.

900 tons, Forest theater, Twenty-first and Market streets, Philadelphia, to Belmont Iron Works.

800 tons, apartment, upper Manhattan, New York, to Hedden Iron Construction Co.

800 tons, Union Pacific railroad bridge, North Platte, Nebr., to McClintic-Marshall Co.

750 tons, First National stores Sommersville, Mass., placed through Fred T. Ley, New York, the order reported going to New England Structural Co.

600 tons, building for the Ward Baking Co., Baltimore, to Dietrich Bros.

585 tons, theater, Tremont avenue, New York, to Dreier Iron Works.

555 tons, 9-story apartment, 123-31 East Eighty-fourth street, New York, to Hinkle Iron Works.

500 tons, school 189, Bronx, New York, to unstated fabricator.

500 tons, theater, Longfellow avenue, Bronx, New York, to Oltmer Iron Works.

420 tons, uptown theater, Milwaukee, to Milwaukee Bridge Co.

400 tons, Miami river bridge, Dayton, O., to Central States Bridge Co.

250 tons, office building, Newark, N. J., to Oltmer Iron Works.

215 tons, beam spans for Northern Pacific railroad in Montana, to St. Paul Foundry Co.

200 tons, cigar plant, Hanover, Pa., to Dietrich Bros.

200 tons, garage for W. E. Karlem, Beloit, Wis., to Worden-Allen Co.

190 tons, structural steel and miscellaneous iron work for factory building, Wurdack Electric Mfg. Co., St. Louis, to Stupp Bros. Bridge & Iron Co.

175 tons, apartment, Brooklyn, N. Y., to a local fabricator.

165 tons, undergrade highway crossings, Robbinsdale, near Minneapolis, for Minneapolis-Northfield & Southern railroad, to Minneapolis Steel & Machinery Co.

150 tons, building for Electric Measure Co., Erie, Pa., through Henry Schenck, general contractor, to Erie Steel Construction Co.

100 tons, Krieger store and office building, Greensburg, Pa., to Guibert Steel Co.

100 tons, repair work at West View and Kennywood amusement parks, Pittsburgh, to Pittsburgh-Des Moines Steel Co.

100 tons, apartment, Lombard street near Van Ness avenue, San Francisco, to Schraders Iron Works.

CONTRACTS PENDING

8000 tons, Penobscot building, Detroit; pending.

3500 tons, Woodlawn theater, Chicago; pending.

2250 tons, hospital addition, Buffalo, John W. Cowper Co., Buffalo, reported low bidder on general contract.

2200 tons, Standard Oil Co. power house, Whiting, Ind.; pending.

2000 tons, building for Union & New England Trust Co., New Haven, Conn.; bids asked.

1500 tons, Famous theater, Seattle; bids being received.
1500 tons, Loew theater, Syracuse, N. Y.; bids asked.
1450 tons, church, Los Angeles; bids in.
1400 tons, a connection with Coney Island yards for transit commission, New York; bids asked.
1300 tons, memorial and city hall building, Cedar Rapids, Iowa; pending.
1200 tons, Illinois hotel, Aurora, Ill.; pending.
1200 tons, Frank warehouse, Seattle; bids being taken.
850 tons, building for Guaranteed Liquid Measure Co., Rochester, Pa.; general contract awarded Rust Engineering Co.; steel to be bought this week.
800 tons, addition to the plant of the Southern Wheel Co., Toledo, O.; revised plans now being figured, bids to be compiled by Dec. 1.
800 tons, manufacturing plant for J. F. Darling, Wilmington, Del.; bids asked.
750 tons, sugar refinery, at Lyman, Nebr.; bids in.
750 tons, highway bridge, Wilmington, Del.; bids asked.
700 tons, Pennsylvania railroad signal bridges, near Wilmington, Del.; pending.
600 tons, John Van Range Co. building, Cincinnati; pending.
500 tons, school 123, Jamaica, Long Island, N. Y.; pending.
435 tons, Glencourt telephone exchange, Oakland, Calif.; bids opened.
400 tons, municipal auditorium, Utica, N. Y.; bids asked.
400 tons, two substations for city transit commission, Philadelphia; bids asked.
350 tons, hospital at Connellsville, Pa.; set aside for two weeks.
300 tons, apartment, Atlantic City, N. J.; George A. Fuller Co. general contractor.
300 tons, building addition for Title Guaranty & Trust Co., New York; bids asked.

Steel Castings Output Increases Slightly

Washington, Nov. 23.—Bookings of steel castings in October totaled 72,270 tons, an increase over September, but a drop from October, 1925, according to returns of 108 companies to the department of commerce. Railway specialties showed a gain from September at 22,026 tons to 27,822 tons in October. Production in October was 77,420 tons compared with 77,315 tons in September. Further comparisons of production and bookings follow:

BOOKINGS

	Total net tons	Per cent capacity	Railway specialties net tons	Miscellaneous net tons
October	74,283	59	26,434	47,849
Total 10 mos.	716,918	57	287,494	429,424
November	83,197	66	38,485	44,712
December	100,377	80	50,654	49,723
Total	900,492	60	376,633	523,859
1926				
January	106,058	83	51,357	54,501
February	93,288	73	41,236	52,052
March	104,847	82	44,507	60,340
April	86,685	67	26,713	59,972
May	78,889	61	31,318	47,571
June	68,030	53	15,992	52,038
July	74,430	57	29,258	45,172
August	*66,152	51	22,945	43,207
September	*65,151	51	22,026	43,125
October	72,270	56	27,822	44,448
Total (9 mos.)	742,923	64	285,279	457,644

PRODUCTION

1926				
January	91,946	72	37,321	54,625
February	90,799	71	41,191	49,608
March	108,231	84	46,628	61,603
April	105,602	82	41,446	64,156
May	95,608	74	42,087	53,521
June	93,392	73	34,290	59,102
July	85,338	66	30,613	54,725
August	*79,568	62	25,945	53,623
September	*77,315	60	22,637	54,678
October	77,420	60	25,587	51,833
Total (10 mos.)	905,229	70	347,745	557,474

*Revised.

Concrete Bars

Good Winter Operations Expected as Mills Approach Dull Season—Orders Heavier

NEW business in concrete reinforcing bars is falling off, but mills expect to maintain a fairly high rate of operations during the winter. They enter the seasonally dull period with fair backlogs. Some mills have built up first quarter and first half rollings, especially for roadwork. Awards are featured by a 3750-ton letting in the Chicago district.

REINFORCING BAR PRICES, PAGE 1376

Chicago, Nov. 23.—Sales and shipments of reinforcing bars are tapering off, but most warehouses are going into the leanest months of the year with unusually good order books. New projects indicate winter activity may be heavier than usual. A building survey by the Illinois labor department disclosed October was a banner month in building projects. Permits amounted to $59,276,000, a gain of $24,000,000 over September and $21,000,000 over October, 1925.

Boston, Nov. 23.—Inquiry for concrete bars is much improved. Warehouse prices on small lots have stiffened and are now close to 3.00c.

Buffalo, Nov. 23.—Demand for reinforcing bars is slowing up with approach of colder weather. Mill operations have been reduced to the seasonal average of about 60 per cent. Mills have been building up considerable first quarter and some first half tonnage and probably will hold this operating rate over the dull period. Prices are unchanged.

Pittsburgh, Nov. 23.—Attractive work involving concrete bars is scheduled for letting soon. A few jobs taking 100 tons apiece are being booked. Revised bids were taken last Saturday on the Montefiore hospital here involving several hundred tons. Mill prices still are firm at 2.00c.

Cincinnati, Nov. 23.—Sufficient business was forthcoming the past week to hold the reinforcing bar market steady. Orders do not involve large tonnages, but are numerous enough to aggregate a sizeable volume. Contractors and other users are buying sparingly, taking only enough stock to meet their immediate requirements. Prices are firm. Pollak Steel Co. is quoting 1.90c, Marion, O., on rail steel bars.

Cleveland, Nov. 23.—Dullness continues unbroken in concrete bar market. Inquiries for the week would not exceed 200 tons in total, some sellers report. A few good projects are pending, but award of steel is slow. One distributor is booked several months ahead, an unusual condition in this territory lately. New billet bars are unchanged at 2.19c, Cleveland, with no test being made. Rail steel is steady at 1.80c, mill.

Awards Compared

	Tons
Awards this week	9,670
Awards last week	2,655
Awards two weeks ago	8,615
Awards this week in 1925	4,535
Average weekly awards, Oct.	8,072
Average weekly awards, 1926	6,405
Total awards to date, 1925	287,013
Total awards to date, 1926	303,280

CONTRACTS PLACED

3750 tons, Sanitary District of Chicago, Stickney, Ill., to undisclosed bidder.
900 tons, Warren-Nash service station, New York, to Jones & Laughlin Steel Corp., through general contractor, Turner Construction Co.
500 tons, American Can Co. building, Brooklyn, N. Y., to Jones & Laughlin Steel Corp., through general contractor, Turner Construction Co.
470 tons, Continental school, Milwaukee, to American System of Reinforcing.
400 tons, Grove street pier, Oakland, Calif., to unstated San Francisco jobber.
400 tons, bank vault reinforcing, Equitable Trust Co. building, New York, to Rivet Grip Steel Co.
300 tons, new high school stadium let by the school board, St. Louis,, to Laclede Steel Co.
250 tons, Tasty Baking Co. building, Philadelphia, to Penn Steel Service Co., through Turner Construction Co.
250 tons, school, Allens Lane, Philadelphia, to Milton Mfg. Co.
250 tons, miscellaneous work involving 140 tons for Herron Hill high school, Pittsburgh, and 90 tons for foundations for Stanley theater, Pittsburgh, both to Electric Weldiing Co.
250 tons, service department, Chevrolet Motor Co., Norwood, O., to Pollak Steel Co.
200 tons, St. Ignatius college, San Francisco, to W. S. Wetenhall Co.
200 tons, United Cigar store warehouse, Fifth and Byrant streets, San Francisco, to Gunn, Carle & Co.
200 tons, apartment, Lincoln Park west, Chicago, to Calumet Steel Co.
180 tons, professional building for J. B. Shipton, Pittsfield, Mass., to Rivet Grip Steel Co.
150 tons, Clark office building, Pittsburgh, to Metzger-Richardson Co.
130 tons, addition to Edison school, Fresno, Calif., to Kyle & Co.
130 tons, McKinley school, Columbus, O., to Concrete Steel Co.
110 tons, apartment, Kenmore avenue, Chicago, to Calumet Steel Co.
100 tons, parts and service building of Chevrolet Motor Co., St. Louis, to Truscon Steel Co.
100 tons, rail steel, addition to plant of National Radiator Co., New Castle, Pa., to Franklin Steel Works.
100 tons, departmental building, Westinghouse Air Brake Co., Wilmerding, Pa., to Carlem Engineering Co.
100 tons, Canterbury apartment, Winthrop avenue, Chicago, to Calumet Steel Co.
100 tons, parochial school, Chicago, to Concrete Engineering Co.
100 tons, welded trusses for floor construction,

Herron Hill high school, Pittsburgh, made of concrete bars, to Concrete Steel Co.

CONTRACTS PENDING

800 tons, addition to Union Central Life Insurance building, Cincinnati; bids to be taken Dec. 2.
700 tons, unit of new water works system of St. Louis; inquiry by St. Louis board of public service.
650 tons, work for International Milling Co., Buffalo; Peterson & Caldwell awarded general contract.
640 tons, state highway bridge, Ashtabula, O.; Standish Engineering Co., Chicago, awarded general contract.
600 tons, Montefiore hospital, Pittsburgh; revised bids filed Nov. 20.
500 tons, bridge across Charles river, Boston; bids in.
350 tons, Marine Terminal manufacturing building, Wilmington, Del.; pending.
300 tons, sewage station, Lynn, Mass.; pending.
250 tons, school, L and Luzern streets, Philadelphia; pending.
180 tons, Murphy Ward Dairy Co., building Chicago; pending.
100 tons, Finance building, Oakland, Calif.; W. S. Wetenhall Co. low bidder.
100 tons, building for the Guaranteed Liquid Measure Co., Rochester, Pa.; general contract awarded Rust Engineering Co.
Tonnage unstated, school, Seventeenth and Steelton streets, Philadelphia; pending.
Tonnage unstated, Green Lane bridge, Philadelphia; pending.
Tonnage unstated, Chesapeake & Hocking railroad construction; pending.

Coal Tonnage Coked in October Declines

By-product coke ovens in October consumed 5,477,000 net tons of coal compared with 1,367,000 tons by beehive ovens, according to the bureau of mines. This was an increase from September for the by-product ovens and a decline for the beehive. Of the by-product coke made in October, 3,150,000 tons or 82.6 per cent was made in plants associated with blast furnaces.

ESTIMATED MONTHLY CONSUMPTION OF COAL IN THE MANUFACTURE OF COKE

(Net tons)

	In by-product ovens	In beehive ovens	Total consumed
1923 Mo. av.	4,523,000	2,507,000	7,030,000
1924 Mo. av.	4,060,000	1,272,000	5,332,000
1925 Mo. av.	4,759,000	1,452,000	6,211,000
July, 1926	5,396,000	1,519,000	6,915,000
August, 1926	5,386,000	1,188,000	6,574,000
September, 1926	5,232,000	2,066,000	7,298,000
October, 1926	5,477,000	1,367,000	6,844,000

Indiana Steelmakers to Meet on Rate Case

Witnesses and testimony to be used by the Indiana state chamber of commerce soon in a hearing before the Indiana public service commission on a petition for lower freight rates on manufactured steel products in Indiana, are to be selected when forty representatives of the steel industry of the state meet shortly in Indianapolis. The state chamber, on behalf of steel manufacturers, jobbers, shippers and receivers, will endeavor to have rates equalized to be commensurate with those adopted in Illinois last May.

Rails, Cars

Miscellaneous Activity Keeps Railroad Track and Equipment Makers Busy

RAILROAD activity is featured by miscellaneous buying. Business of the past week included award of 25,000 tons of rails at Chicago, 10,000 tons at Boston, 8000 to 9000 tons of track fastenings, 75 locomotives for the Pennsylvania and 70 tenders for New York Central. Illinois Central may buy 8000 to 9000 cars and Norfolk & Western 2000.

RAILROAD TRACK MATERIAL PRICES, PAGE 1376

Chicago, Nov. 23.—Rail buying at western mills stands about 10 per cent higher than in the fall buying period last year, and indications are the customary 25 per cent additional for 1927 shipment will be ordered on options. A feature is heavy buying of and inquiry for track fastenings. Sales the past week totaled 8000 to 9000 tons, while inquiry is more than twice that amount. Inquiry includes the 25,000 to 30,000 tons of tie plates, angle bars and track bolts to be bought by the New York Central. New inquiry for rails the past week reached 10,000 tons, while orders for 25,000 tons were placed with mills in the district, coming from three roads.

Outside of the Rock Island inquiry for 2500 cars, Missouri Pacific's 4000 freight and 64 passenger cars, and the St. Paul inquiry for 1500 cars, no new business is in sight. Reports are that the Rock Island inquiry is to be more than doubled later. Northern Pacific has ordered 25 caboose car underframes from the Pacific Car & Foundry Co., and the Conley Tank Car Co. has ordered 200 tank cars from the American Car & Foundry Co.

Boston, Nov. 23.—Railroad buying continues active. Maine Central bought 10,000 tons of rails and about 1000 tons of joints and track material. Boston & Maine is in the market for 25 Mikado-type locomotives.

New York, Nov. 23.—Railroad equipment buying is featured by the placing of 75 locomotives by the Pennsylvania. Car buying continues light. While inquiry is showing improvement, the general situation is far from active.

American mills failed to get the rail business on which the municipality of Yokohama recently took bids. Over 3000 tons of high T-rails were placed by Mitsui & Co. with French maker. The guard rails, which went to Suzuki & Co., also were placed outside of this country.

Pittsburgh, Nov. 23.—Orders have not been distributed as yet in connection with the large tonnage of track accessories to be placed by the New York Central railroad, but these probably will materialize this week and local producers except to share liberally. The Pennsylvania continues to buy on a month-to-month basis. Baltimore & Ohio, Boston & Albany, and other roads are negotiating for large tonnages of spikes, tie plates, track bolts, etc. Prices are unchanged and apparently firm.

Light rail orders have diminished again. The price is unchanged at $36, on the billet-rolled product.

CAR ORDERS PLACED

American Refrigerator Transit Co., 500 cars, to General American Tank Car Co.
Conley Tank Car Co., 200-tank cars, to American Car & Foundry Co.
Chicago & North Western, noted in last week's issue as closing on 500 sets of steel underframes and superstructures, will build 500 freight cars in its own shops.
Northern Pacific, 25 caboose car underframes, to Pacific Car & Foundry Co.
Northern Refrigerator Car Co., Milwaukee, 201 refrigerator cars, to Pullman Car & Mfg. Corp.
Western Maryland, 500 hopper bodies, to Bethlehem Steel Co.

LOCOMOTIVE ORDERS PLACED

Pennsylvania, 75 locomotives, to Baldwin Locomotive Works.
New York Central, 70 locomotive tenders, to American Locomotive Co.

CAR ORDERS PENDING

Atlantic Coast Line, 100 ballast cars; pending.
Barnes Coal Co., 200 mine cars; pending.
Buffalo, Rochester & Pittsburgh, repairs on 850 wooden box and gondola cars; contemplated.
Chicago & North Western, 250 ore cars; pending.
Chicago, Rock Island & Pacific, 73 miscellaneous passenger coaches; pending.
Erie, 21 passenger car underframes; bids asked.
Fruit Growers Express, 400 underframes; pending.
Great Northern, 25 tank cars; bids asked.
Illinois Central, 8000 to 9000 freight cars; inquiry expected out shortly.
Lehigh Valley, 500 hoppers and 250 automobile cars; pending.
Norfolk & Western, 2000 freight cars; inquiry expected out soon.

LOCOMOTIVE ORDERS PENDING

Boston & Maine, 25 locomotives; contemplated.
Denver & Rio Grande Western, 10 locomotives, bids asked; this previously was noted as contemplated.

Engineers Inspect Mine

Pittsburgh, Nov. 23.—More than 75 engineers, members of the Cleveland Engineering society and the Engineers' Society of western Pennsylvania, were guests of the Duquesne Light Co., last week on a tour of the Harwick Coal & Coke Co's mines at Harwick, Pa. From Harwick, the party went to Colfax, where it inspected the superpower plant of the Duquesne Light Co., and then to the American Window Glass Co., at Arnold. In the evening a dinner was served at the William Penn hotel.

Wire

Manufacturers' Wire Active But Nails Are Quiet—Stocks Are Held Low

IN SPITE of slack buying, low stocks and lack of demand, prices of wire and its products hold firmly. Mills, jobbers and retailers are keeping stocks at a minimum, even to a point where an increase in demand might cause shortage. Manufacturers using wire are taking a larger tonnage than others. Building has slackened and this is reflected in nails.

WIRE PRICES, PAGE 1376

Pittsburgh, Nov. 23.—Manufacturers' wire in various forms is active for this season but wire nails are quiet. Jobber buying is at a minimum. Jobbers' stocks, like those of manufacturers, are allowed to shrink as much as possible to cut down inventories. Except in the South, cold weather is interfering with building operations and this is checking nail consumption. Wire mills are being operated at 50 or 55 per cent of capacity, but base prices are firm.

Boston, Nov. 23.—Wire sales have dropped to the low point in two months or more, and inquiry is far from encouraging. Market authorities feel that a quiet period is ahead until the end of the year. Nails, however, are selling in good volume with one mill reporting an increase in demand. Plain wire ranges from 2.75c to 2.875c, Boston.

Chicago, Nov. 23.—Despite the lull in specifications and sales of wire products, particularly from the jobbing trade, the price tendency is firm. Manufacturing demand, although ahead of jobbing business, has failed to measure up to expectations earlier in the fall. Operations are declining and are below 60 per cent. Dealers' and jobbers' stocks are so low that anything approaching normal demand for spring trade will create a shortage, it is believed.

Strip Steel

Better Automotive Buying Is Appearing in All Markets

STRIP PRICES, PAGE 1376

Chicago, Nov. 23.—Schedules for hot strip steel specifications in December from automotive parts makers are expected to be 15 to 20 per cent over November, and heavy January schedules also are in contemplation. While some weakness has been shown in smaller sizes, the larger producers are holding to 2.50c to 2.60c, Chicago, for hot strip.

The cold rolled strip price situation is irregular, quotations being on the basis of 3.25c to 3.60c, Pittsburgh. Demand from the farm areas for hardware and fencing accessories has fallen off.

Pittsburgh, Nov. 23.—Some additional first quarter business has been booked in hot and cold strips, but the general attitude among buyers is to avoid contracts, as they have for two years past. Specifications are not sufficiently heavy to cause operating schedules to rise. The general average is 55 to 60 per cent. Some cold strip producers claim to be maintaining a 3.50c to 3.60c selling basis, but others have had to go as low as 3.25c. Some producers in other sections have not stopped there for attractive rollings. Each tonnage that comes up for attention is considered by itself. The hot strip price is firm at 2.30c. Automotive tonnage, held up as it usually is at this season, appears to be loosening somewhat and from now on these specifications will be somewhat accelerated for next month's use.

Youngstown, O., Nov. 23.—Strip mills in the valleys have been able to run at satisfactory rates generally on cold-rolled orders. Hot-rolled strip, however, is not in such good demand and mill operations have been spotty. Cold-rolled is quoted at 3.25c to 3.60c, Pittsburgh, depending upon widths; and hot-rolled at 2.30c to 2.50c, Pittsburgh.

Bolts, Nuts, Rivets

Extra 5 Per Cent on Less Carloads Is Being Granted

NUT AND BOLT PRICES, PAGE 1376

Pittsburgh, Nov. 23.—Effective Nov. 15, nut and bolt manufacturers are granting an extra 5 per cent discount to wholesale and retail jobbers in less-carload lots, and this means that 25 cents per 100 pounds is added to the discount on hot-pressed and cold-punched square or hexagon nuts. This makes the discount on large machine bolts with cut thread (all sizes) 50, 10, 10 and 5 per cent off. The new discounts apply so far as the consuming trade is concerned, when carload lots are purchased, the old schedule applying as far as less-carload lots are concerned, namely 50, 10 and 10 off for large machine bolts. Some first quarter contracts have been taken on rivets at 2.50c to 2.60c by producers here, and specifications against current contracts have shown more life the past week. Operations among nut and bolt plants do not average more than 60 or 65 per cent.

Chicago, Nov. 23.—Bolts and nuts remain firm at 50, 10 and 10 off for large machine bolts, with the question of a slight readjustment in first quarter unsettled. The customary concession on carload shipments prevails. November specifications will wind up more satisfactorily than the outlook indicated. Requirements from farm implement makers, although below last year, thus far have shown no sharp falling off.

Cold Finished Steel

Books Open for First Quarter but Few Have Bought

Pittsburgh, Nov. 23.—Books are open for first quarter cold finished bar contracts, but only a few customers have signed. The ordinary market price still is 2.40c and while some have 2.30c for preferred customers for large tonnages, that is claimed to be the absolute minimum. Specifications have been slightly better, more releases being received against automotive tonnage. Plant operations are 50 to 65 per cent, a local interest operating its cold finished departments on a 65 per cent basis. The general average is a little below 60 per cent.

Stoker Bookings Drop

Washington, Nov. 23.—Bookings of mechanical stokers in September totaled 112, a drop of 15 from the 127 total in September according to returns from 12 manufacturers to the department of commerce. Both fire tube and water tube installations dropped in October. Further comparisons of bookings by months follow:

	Stokers sold	Fire tube boilers	Water tube boilers
1923 Total	1,464	177	1,287
1924 Total	1,128	161	967
1925 Total	1,348	263	1,085
October	114	22	92
November	76	8	68
December	108	21	87
January, 1926	72	10	62
February	83	12	71
March	132	31	101
April	145	22	123
May	129	54	75
June	175	24	151
July	125	20	105
August	104	25	79
September	127	31	96
October	112	28	84

Studies Puddling Layout

The mechanical puddling plant of the American Puddled Iron Co., Warren, O. taken over under a lease-option arrangement by A. M. Byers Co. Pittsburgh still is idle. The date of resumption of the plant is contingent upon a pending study of the machinery and equipment by engineers of the company.

Hultberg Johanson Tool Co., Jamestown, N. Y., has filed a petition in bankruptcy at Rochester listing liabilities at $14,932, assets at $12,290 and secured claims at $13,000.

Nonferrous Metals

Prices Sag as Buying Continues Light—Supplies in Most Lines Are Slightly Larger Than Consuming Demand

Prices of the Week, Cents a Pound

	Copper									
	Electro delivered	Lake delivered	Casting refinery	Spot Straits Tin, N. Y.	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Nov. 17	13.87½	14.00	13.47½	71.50	8.00	7.80	7.25	26.80	13.00	35.00
Nov. 18	13.87½	14.00	13.47½	70.75	8.00	7.80	7.22½	26.80	13.00	35.00
Nov. 19	13.87½	14.00	13.47½	70.50	8.00	7.80	7.22½	26.80	13.25	35.00
Nov. 22	13.85	13.97½	13.45	71.50	8.00	7.80	7.22½	26.80	14.25	35.00
Nov. 23	13.75	13.87½	13.37½	72.50	8.00	7.80	7.20	26.80	14.25	35.00

NEW YORK, Nov. 23.—Buying of nonferrous metals has been light during the past week and prices generally have sagged. Lead, however, with steady buying has been firm. Tin has fluctuated both ways and today touched the highest level in recent years. Nickel and aluminum are unchanged while zinc appears fairly steady.

The letdown in the market is in accord with the dullness in some lines of business, and in plant operations the metal industries are holding up as well as others. Supplies in most lines are a little larger now than consuming demand but not excessively so.

Copper—The red metal is passing through one of the quietest markets in months and it is not surprising that prices are easy. Prices dipped below 13.85c, delivered, the past few days and the exact bottom of the market was difficult to locate, as some producers were open to bids. Today the market was definitely quoted 13.75c, delivered.

Shipments continue of good size but product mills as well as copper producers have been eating into their backlogs The export market has been fairly active lately but the price has been cut to come more in line with the domestic market and at the opening of the week was 14.12½c. c.i.f. Scrap copper buying prices have been cut ¼ cent and brass and copper products have been cut a similar amount in line with the downward trend in the copper market.

Tin—Users of tin have been chiefly interested in December metal the past few days and it is thought they have not covered much into the new year. For that reason the market is still fairly strong. Today the market was strong at 72.50c for spot Straits. Supplies are fairly tight although a little more liberal. Spot metal is held more than 1 cent above December delivery and the latter nearly 2 cents above January arrival. Business the past week was moderate, with good buying on a dip in the market.

Zinc—Prime western metal has been in a lighter market the past week after fairly steady buying for several weeks. Smelters are well sold for a short time ahead and consumers appear to be fairly well covered for December, with not much interest farther ahead. Prompt shipment continues 2½ points over December. High grade is unchanged at 9.25c to 9.50c.

Lead—Buying has continued fairly active, with more December business in the Midwest than in the East. In the Midwest prompt metal now is in a fairly strong position. Prices are fairly steady.

Aluminum—Buying is quiet and there is some cutting of prices on resale metal. The major market is steady. Foundries are holding off contracts for first quarter.

Antimony—This erratic metal has gone up rapidly in the past few days, mostly on account of buying by dealers.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	18.62½
Copper, hot rolled	22.25
Zinc, (100-pound base)	11.75
Lead full sheets (cut ¼c more)	11.75 to 12.25
Aluminum, bright flat, up to 10 gage	36.50
SEAMLESS TUBES	
High brass	23.50
Copper	24.25
RODS	
High brass (round ⅝ to 2½-inch	16.37½
Naval brass	19.12½
WIRE	
Copper, small lots	15.75
High brass	19.12½

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	8.50 to 8.75
Chicago	8.75 to 9.00
Cleveland	9.50
HEAVY YELLOW BRASS	
Chicago	7.50 to 7.75
Cleveland	7.00
ZINC	
New York	4.25
Cleveland	3.50 to 4.00
HEAVY COPPER AND WIRE	
New York	11.00 to 11.25
Boston	11.00 to 11.50
Chicago	10.25 to 11.00
Cleveland	11.25 to 11.50
RED BRASS BORINGS	
New York	8.00 to 8.25
YELLOW BRASS TUBING	
Cleveland	7.00
LIGHT COPPER	
New York	9.00 to 9.25
Chicago	9.25 to 9.50
Cleveland	9.00 to 9.75
LIGHT BRASS	
Boston	6.00 to 6.50
Chicago	6.75 to 7.00
Cleveland	5.50 to 6.00
ALUMINUM	
Clippings, Cleveland	18.00 to 20.00
Borings, Cleveland	13.00
Cast, Cleveland	14.00 to 16.50
Cast, Boston	18.00 to 18.50

Secondary Metals

Remelt aluminum No. 12	22.00 to 22.50
Brass ingot, 85-5-5-5	11.87½ to 12

Coke By-Products

Fertilizer Industry Specifying Sulphate of Ammonia Less Freely

New York, Nov. 23.—Light oil distillate demand remains brisk, with prices generally unchanged. Pure and 90 per cent benzols are quoted at 24 cents, works, per gallon, for material in tank car lots and 29 cents, in drums; toluol and solvent naphtha, 35 cents, works, in tanks and 40 cents, in drums; and commercial xylol 36 cents, works, in tanks and 41 cents, in drums.

Fresh inquiry for sulphate of ammonia is sluggish, and in view of the overproduction in cotton, the fertilizer industry is slightly slowing up its commitments against orders placed last summer. However, stocks at producers' plants are still light, with prices holding nominally unchanged. Suphate for domestic consumption is quoted at $2.45 to $2.50, delivered, and for foreign, $2.45 to $2.50, port, for material in double bags.

Naphthalene also is in light demand, at 5 to 7 cents, works, for flakes, and 6 to 8 cents for balls.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contract
Pure benzol	$0.24	
90 per cent benzol	0.24	
Toluol	0.35	
Solvent naphtha	0.35	(nominal)
Commercial xylol	0.36	(nominal)
Phenol	0.22	0.22

Per Pound at Producers' Plants

Naphthalene flakes	0.05 to 0.07
Naphthalene balls	0.06 to 0.08

Per 100 Pounds Delivered

Sulphate of ammonia	2.47½	

Fewer freight cars were in need of repair on Nov. 1 than at any time in the last five years, the American Railway association announces. Reports show 139,484 freight cars in need of repair, or 6.1 per cent of the number on line. This was a decrease of 5843 cars under the best previous record established on Oct. 15, 1926.

Warehouse

Seasonal Decline More Noticeable Although Some Districts Report Improvement—Prices Show No Definite Changes

ALTHOUGH iron and steel warehouse trading is marked by improvement in some distributing centers, the general trend of demand shows a more noticeable seasonal decline. Activity at New York and Cincinnati is unusual for the season. Prices continue on a firm basis with a minimum of changes.

Unusual activity for the season prevails in the New York metropolitan warehouse market. One large jobber asserts that trading so far this month is fully 5 per cent in excess of the rate in October, which was better than any preceding month this year. Some good sales of blue annealed sheets are reported, including one of 40 tons.

A decline regarded as normal is reported by Buffalo warehouses. November compares favorably with the corresponding month of last year. Except that fewer orders are being received from points outside strictly Buffalo buying territory the warehouse situation in that city shows little change.

Contributing to a well sustained and satisfactory warehouse condition in Pittsburgh are the many orders coming through for quick shipment. Customers are maintaining such low inventories they often find themselves shy of equipment and cannot wait for mill deliveries. Sheet orders are heavy in the aggregate and some individual orders call for comparatively large tonnages.

Demand for warehouse products in the Cincinnati district showed improvement the past week, particularly for sheets and plates. Blue annealed sheets were exceedingly active.

Arrival of wintry weather at St. Louis and the record November blizzard had a tendency to slow down warehouse business. Prior to this, however, volume with most interests had been good. Movement of building materials has quieted, except reinforcing steel bars. New business in plates and sheets has receded somewhat, but this is seasonal and no more marked than the average in recent years. Sales of wire and wire gods, particularly fencing material,

(*Concluded on Page* 1391)

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles	3.30c
New York	3.24c
Philadelphia	2.90c to 3.20c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.80c to 4.06c

IRON BARS

Boston	3.265
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
Ft. Worth	3.75c
New York	3.24c
Philadelphia	2.90c to 3.20c
St. Louis	3.15c
Tulsa	3.80c to 4.06c

REINFORCING BARS

Boston	3.265 to 3.50c
Buffalo	3.30c
Chicago, billet	2.25c to 2.60c
Chicago rail steel	2.00c
Cincinnati	3.20c to 3.30c
Cleveland	2.50c to 3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles, C.L.	3.05c
Los Angeles, L. C. L.	3.30c
New York	3.15c
Philadelphia	3.00c to 3.15c
Pittsburgh	2.50c to 2.60c
San Francisco, C. L.	2.30c
San Francisco, L C. L.	2.45c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.50c to 2.60c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.25c
Ft. Worth	4.50c
Los Angeles	3.20c
New York	3.34c
Philadelphia	2.75c to 3.20c
Pittsburgh	3.00c
Portland	3.10c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.80c to 4.16c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.00c
Cleveland, 3/16-inch	3.225c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Ft. Worth	4.50c
Los Angeles	3.20c
New York (sheared and universal)	3.34c
New York (floor)	5.25c
Philadelphia	2.75c to 3.20c
Philadelphia, 3/16-inch	2.95c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.80c to 4.16c

NO. 10 BLUE ANNEALED SHEETS

Boston 3/16-inch	3.915c
Buffalo	3.80c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.65c
Los Angeles	4.00c
New York	3.89c
Portland	4.25c
Philadelphia	3.50c
Pittsburgh	3.40c
San Francisco	4.00c
Seattle	4.25c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.05c to 4.25c

NO. 24 BLACK SHEETS

Boston	5.10c
Buffalo	4.30c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.80c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.00c
New York	4.35c
Philadelphia	4.35c
Pittsburgh	3.95c
Portland	4.90c
San Francisco	4.90c
Seattle	4.90c
St. Louis	4.45c
St. Paul	4.20c
Tulsa, No. 28	5.00c

NO. 24 GALVANIZED SHEETS

Boston	5.80c
Buffalo	5.15c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.05c
Ft. Worth	5.90c
Los Angeles	5.75c
New York	5.10c
Philadelphia	5.30c
Pittsburgh	4.80c
Portland	5.75c
San Francisco	5.65c
Seattle	5.75c
St. Louis	5.25c
St. Paul	5.15c
Tulsa, No. 28	6.00 to 6.31c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.80c
Ft. Worth	4.40c
Los Angeles	4.05c
New York	3.99c
Philadelphia	3.75c to 3.90c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cleveland	3.65c
Detroit	4.30c
New York	4.49c
Philadelphia	4.00c to 4.25c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds and hexagons	Flats and squares
Boston	4.05c	4.55c
Buffalo	3.90c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.90c	4.40c
Detroit	3.85c	4.35c
Los Angeles	5.25c*	.....
New York	4.00c	4.50c
Philadelphia	4.00c	4.50c
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	4.25c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....
Tulsa	4.66c	5.16c

*Rounds only.

COLD ROLLED STRIP

Boston, 0.100 inch, 500 lbs. lots	6.15c
Buffalo	6.25c
Chicago	6.25c
Cincinnati	7.15c
Cleveland, over 500 lbs. lots	5.95c
Detroit	6.20c
New York	6.25c
Philadelphia	6.25c
Pittsburgh	6.30c

FOREIGN IRON AND STEEL

New York duty paid

Swedish, hollow drill steel	15.00c
Swedish iron bars round	6.25c
Flats and squares	6.50c

WELDED PIPE

Discounts from warehouse, New York City Standard Steel Pipe

WROUGHT STEEL PIPE

	Black	Galvanized
⅛-inch butt	—28	+21
¼ to ⅜-inch butt	—36	— 3
½-inch butt	—46	—29
¾-inch butt	—51	—37
1 to 3-inch butt	—53	—39
2-inch lap	—40	—22
2½ to 6-inch lap	—48	—35
7 and 8-inch lap	—44	—17
9 and 10-inch lap	—38	—14
11 and 12-inch lap	—37	—12

WROUGHT IRON PIPE

	Black	Galvanized
¼ to ⅜-inch butt	+44%	+78%
½-inch butt	— 4	+19
¾-inch butt	— 1	+ 9
1 to 1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
2½-inch lap	— 9	+ 6
3 to 6-inch lap	— 3	+ 6
7 to 12-inch lap	— 3	+16

Coast Market Is Quiet

Foreign Competition Less as Prices Are Advanced—Plates for Tanks Give Best Activity

SAN FRANCISCO, Nov. 20.—(*By Air Mail*)—Little of importance transpired this week in Pacific Coast iron and steel markets. While local and eastern steel producers continue to feel the competition of foreign mills, the situation has become easier since prices on foreign steel have advanced and deliveries, in many instances, have not been satisfactory. Except for cast iron pipe, less interest is being displayed in foreign material. Prices are firm.

Pig Iron and Coke

Although there is an upward tendency in pig iron and coke, practically no first quarter business has been booked. Sales and inquiries for pig iron were confined to small lots for prompt shipment. Quotations on continental foundry coke continue nominal at $15.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah Foundry	25.00 to 26.00
*German	24.25
*Indian	25.00
*Dutch	22.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Interest in mild steel bars continues to center around the 600 tons inquiry of the Western Harvestor Co. at Stockton, which has been pending for several weeks. Awards of concrete bars aggregated close to 1000 tons and included 400 tons for a pier in Oakland, 200 tons each for a warehouse and college building in San Francisco and 130 tons for a high school in Fresno, Calif. New inquiries involved lots of less than 100 tons with one exception. Ellensburg, Wash., will open bids Dec. 28 for 955 tons for the Kittitas canal. Prices on out-of-stock material in the San Francisco district are firmer and 2.30c to 2.45c represents the general range.

While hoop and band specifications are slower, bookings are fair for this time of the year and up to the general average for the season. The price is firm at 2.50c base Pittsburgh or equivalent.

During the past two or three weeks various oil companies have shown interest in new tank projects and a number have been placed or are up for figures. Awards this week totaled over 1200 tons and included three 80,000-barrel tanks for the California Petroleum Corp., Los Angeles, involving 900 tons booked by the Western Pipe & Steel Co., and one 80,000-barrel tank for the Shell Oil Co., Los Angeles, requiring 310 tons, placed with the Llewellyn Iron Works. No action has yet been taken by the Shell Oil Co. on its inquiry for nine 45,000-barrel tanks calling for 1800 tons. A number of plate fabricators are figuring on the Yakima pipe line project which will require about 10,000 tons. Prices are firm at 2.30c c.i.f. Coast ports.

Most structural shape awards this week were confined to small tonnages. Schrader Iron Works booked 100 tons for an apartment house in San Francisco. A number of new projects are up for figures, including 1500 tons for a theater in Seattle, 1800 tons for an office building in Los Angeles and 1200 tons for a warehouse at Seattle. Pending business exceeds 22,000 tons. Prices continue unchanged at 2.35c c.i.f. During the past week approximately 200 tons of foreign structural material, 500 tons of merchant and reinforcing bars, 1000 kegs of wire nails and 1600 rolls of wire fabric arrived in port.

Other Finished Material

Cast iron pipe continues in good demand and prices are firm at around $51 base delivered. Awards this week totaled 1100 tons, the South San Francisco Water Co. placing 500 tons with Grinnell Co., Medford, Oreg., awarding 315 tons to the American Cast Iron Pipe Co. and the United States Cast Iron Pipe & Foundry Co., and Huntington Park, Calif., placing 281 tons with Grinnell Co. Pending business aggregates 5000 tons. Bids were opened this week on 1770 tons for Los Angeles and San Louis Obispo came into the market for 258 tons. Movement of standard tubular goods was confined to small tonnages for the most part. Los Angeles placed 286 tons of ½ to 1 inch galvanized pipe with the Republic Supply Co.

Northwest Trade Slow

SEATTLE, Nov. 18.—While no awards of moment for iron and steel have been made this week, several contracts involving considerable tonnage are to be up for figures within the next month.

Construction is slacking off as there is a tendency to delay projects. Estimates of Seattle's total are $32,000,000 instead of $35,000,000 for 1926 as previously predicted. Home building both here and in Portland continues above normal.

Pig Iron and Coke

With the British coal strike about to be settled buyers of pig iron and coke are expecting readjustment of prices and there is a disposition to postpone buying. No. 1 Columbia has advanced to $27 and buyers are ordering in small lots for quick delivery. Some Continental iron is afloat for delivery here but purchasing is light as users are well supplied.

Bars, Plates and Shapes

Prices are unchanged with bars, both local and domestic, at 2.65c, plates at 2.30c and shapes at 2.35c. Mill representatives report business quiet at the moment although many new projects are scheduled for bids soon.

Bids were opened this week for the Orpheum theater at Vancouver, B .C. The structural award for this project, 240 tons, was previously announced but the reinforcing contract, 230 tons, is pending. Contracts will be awarded next month for a 12-story hotel at Fourth and Olive streets, Seattle, involving an unstated amount of reinforcing. Contract is also pending for reinforcing for a $150,000 warehouse for the Western States Grocery Co.

The largest ship repair job awarded in months on this coast went to the Burrard Dry Dock Co. Ltd., Vancouver, B. C., which will require four months to recondition the Japanese steamer Kaikyu Maru, at a cost of about $300,000. The steel tonnage involved is not stated but numerous hull plates, frames and beams will have to be replaced.

The trade is interested in the Yakkim water system job, bids Dec. 2, in which about 2000 tons of plates are involved. No other large plate specifications are in this market.

Finished Materials

There is no change in the wholesale jobbing situation. Cuts in small shapes and bars, announced by a number of warehouses last week, have not been agreed to by one of the largest houses. Business is rather quiet although there is a fair total volume represented by small tonnages. This applies to everything in stock.

Interstate Construction Co. has the contract for the Eleventh Avenue So. water pipe job, Seattle, involving about 500 tons of cast iron pipe contract for which is pending. As far as known by local representatives the Wenatchee job, involving 250 tons has not yet been awarded. The Yakima job, bids Dec. 2, will call for about 500 tons of cast iron pipe in addition to 2000 tons of steel plate. The contract at Shelton, Wash., has not been awarded, the first bids having been rejected. New tenders will be received Nov. 29 for cast iron and wood pipe as well as steel mains.

About 1800 the Champlain iron ore district in New York was developed.

Steel Plate Bookings Again Decline

Washington, Nov. 23.—Bookings of fabricated steel plates in October, totaling 33,137 tons, registered further decline, returns to the department of commerce from 36 manufacturers indicate. Oil storage tanks showed an increase from 16,734 tons in September to 20,285 tons in October, but refinery materials and equipment and stacks and miscellaneous more than offset the gain with their losses. Comparisons of bookings by months follows:

	Total	Oil storage tanks	Gas holders	Blast furnaces	Stocks and miscellaneous
1923	539,043	296,128	44,576	9,815	141,359
1924	313,109	123,368	43,747	12,601	108,046
1925—					
October	29,405	8,076	1,432	2,500	13,688
Total 10 mo.	271,820	72,335	28,890	11,670	111,323
November	29,219	7,492	4,559	581	10,153
December	31,765	7,714	3,172	407	14,956
Total (year)	332,804	87,541	36,621	12,658	136,432
1926					
January	25,292	8,165	2,286	1,720	9,649
February	31,282	9,630	4,068	806	9,788
March	37,662	12,629	5,048	377	13,617
April	33,542	6,042	5,261	1,857	17,898
May	46,473	15,728	4,190	1,742	19,608
June	39,551	10,829	8,282	1,123	16,099
July	31,356	11,908	1,716	989	14,088
August	45,001	21,011	1,240	1,728	13,077
Sept.	*33,316	*16,734	871	861	9,240
October	33,137	20,285	33,706	12,197	129,864
Total 10 mo.	356,612	132,971	33,706	12,197	129,864

*Revised.

Automotive Production Drops in October

Washington, Nov. 23.—Production of motor vehicles, passenger cars and trucks, dropped in October from the September level, according to 172 manufacturers' reports to the department of commerce. Actual production for October in the United States, totaled 288,848 passenger cars and 42,890 trucks, compared with 350,913 and 46,428 for September. Data for earlier months include 77 additional manufacturers now out of business. Twenty small manufacturers did not report in time for compilation of the September data. Further comparisons follow:

Passenger Cars

Totals for United States and Canada

	1923	1924	1925	1926
Jan.	228,860	293,822	213,851	284,703
Feb.	260,320	343,444	253,955	334,524
Mar.	427,038	357,006	334,214	399,105
April	351,622	346,355	393,262	401,836
May	358,646	286,266	384,548	394,569
June	343,985	225,034	366,510	358,365
July	303,497	244,503	360,124	329,950
Aug.	318,848	255,193	223,517	*393,040
Sept.	302,340	263,468	274,227	*363,537
Oct.	338,469	260,845	408,017	299,443
Nov.	288,810	204,316	337,435	.....
Dec.	279,862	182,028	286,141	.....
Totals	3,702,391	3,262,764	3,835,801	3,559,072

Trucks

Totals for United States and Canada

	1923	1924	1925	1926
Jan.	20,506	30,627	28,202	33,461
Feb.	23,283	32,756	34,481	41,685
Mar.	36,619	36,270	45,179	49,233
April	39,641	37,766	47,983	53,847
May	45,677	35,112	45,718	*51,333
June	42,453	28,884	38,150	*47,115
July	31,703	26,227	41,870	*41,921
Aug.	32,195	28,503	37,849	*47,907
Sept.	29,626	31,829	60,482	*51,299
Oct.	31,515	32,332	46,013	49,965
Nov.	29,166	27,766	40,048	.....
Dec.	28,862	27,324	34,487	.....
Total	391,246	375,426	500,461	421,306

**Canada output estimated.
*Revised.

Steel Barrel Shipments Lightest in Months

Washington, Nov. 23.—Steel barrel activity experienced a marked setback in October, production, shipments, stocks, and unfilled orders falling below the levels of September, according to returns of 31 companies to the department of commerce. Production fell from 511,118 pieces in September to 493,363 in October, the lightest since January. Shipments fell from 508,548 in September to 497,031 in October.

Steel Barrel Manufacturers association, Cleveland, reports shipments of 364,800 pieces by its members, and unfilled orders of 821,479 barrels. In October, 37.3 per cent of capacity on I. C. C. barrels was employed and 48 per cent on light barrels, or 45.6 per cent on all barrels. Total volume of business done by association members, in October totaled $1,299,146. Comparisons of department of commerce figures follow:

	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
1925				
July	497,152	506,894	314,727	974,656
August	498,449	495,736	263,588	851,079
September	510,869	503,221	237,580	774,996
October	553,545	555,981	356,626	534,278
November	498,929	498,070	251,367	996,978
December	467,485	474,742	368,286	1,377,060
1926				
January	468,722	469,432	431,772	1,334,074
February	522,486	518,104	543,381	1,153,947
March	622,949	622,312	369,576	1,275,490
April	602,058	608,056	414,367	864,792
May	581,962	582,352	417,718	792,097
June	626,812	624,082	407,184	892,929
July	585,734	593,611	386,536	907,065
August	523,037	511,542	368,578	802,420
September	511,118	508,548	286,160	1,002,271
October	493,363	497,031	222,491	926,834

Given Hoist Contract

New York, Nov. 23.—The American Steel & Wire Co., Worcester, Mass., has awarded to the Reading Chain & Block Corp., Reading, Pa., a contract for 160 one-half ton electric hoists and cranes. This is said to constitute one of the largest crane and hoist orders ever placed at one time. The award was made after a competitive test. The Reading company is working overtime and has started a night shift. For the past year it has been working at capacity.

Pig Iron Market Is Quiet

(*Concluded from Page* 1377)

in lots ranging from 200 to 1000 tons. Several small lots of southern iron were placed in this district, and a Chicago producer sold 500 tons of foundry iron to an east side specialty maker. The principal inquiries involved about 2000 tons for an Iowa melter for first quarter and 1000 to 2000 tons of basic for a steelmaker in this district. Prices are steady at recent quotations, except on small lots of southern iron which have been priced to meet northern competition.

Philadelphia, Nov. 23.—Sales of foundry iron were somewhat larger the past week although conditions in general continue quiet. Pennsylvania foundry iron has been selling in some instances at $23, base, furnace, but the usual figure is $22.50, base, plus 50 cents for No. 2X and $1 for No. 1X. It is understood further sales of northern New York state foundry have been made in this territory at $22.65, delivered, for No. 2 plain. Several sales of basic show the minimum to be $22, furnace, equivalent to $22.76 to $23.26, delivered eastern Pennsylvania. A fair tonnage of German foundry iron bought several months ago has sold for about $22, duty paid, Philadelphia. Baldwin Locomotive Works is inquiring for 1500 to 2500 2.50 to 3.25 silicon foundry. Much low phos is under negotiation.

Birmingham, Ala., Nov. 23.—Pig iron sales continue small, but the probable make for the remainder of the year is being covered. Few sales have been made for first quarter, although books have been opened and the base price quoted at $20. Activity is noted at the stove foundries, the trade showing an unusually strong condition.

Jobbers Sales Declining

(*Concluded from Page* 1389)

are picking up as farmers complete harvests and turn to repair work.

November warehouse business at Chicago is not up to the October average, which is seasonal. With the approach of the inventory period, few manufacturers desire to carry large tonnages.

Further slight decreases are noted in warehouse demand at Detroit, but current business remains satisfactory. No increase in demand is looked for until after Jan. 1. Current demand is well diversified.

Easing off in warehouse buying in Cleveland is gradual. Sales generally are ahead of November 1925, but slightly below October. Hampered by winter weather, building operations are less active, being reflected in lessened demand for sheets and building products. Prices in Cleveland are firm and are strengthening in competitive territory in this district.

Philadelphia jobbers report a continued lowering level of business for November compared with October. Steel bar prices continue to range from 2.90c to 3.00c locally. Sheet shading is infrequent and concrete bars are firm at a 3.00c minimum.

Iron, Steel Rate Probe Ordered

Interstate Commerce Commission Decides to Review Tariffs in Official Territory as Attacks Grow—To Arrange Procedure at New York, Dec. 4—Large Producing Territory Included

WASHINGTON, Nov. 23.—A general investigation of railroad freight rates on manufactured iron and steel articles usually included in the manufactured iron and steel tariffs in official territory has been ordered by the interstate commerce commission. A preliminary conference has been called at New York, Dec. 4, when representatives of the commission, the various state commissions in official territory, shippers and the carriers will be present.

The decision to conduct a general investigation springs from the large number of important cases, attacking freight rates on iron and steel articles between various points in official territory, now pending before the commission. It is understood that the investigation proposed meets general agreement. The commission states that "official territory for the purpose of this inquiry will be understood to include the territory east of the Mississippi river and north of the Ohio river and the line of the Norfolk & Western railroad from Bristol, Tenn.-Va., to Norfolk, Va., as well as the lower peninsula of Michigan and a narrow strip in southern Wisconsin."

Ohio Rates Questioned

The commission has stated, in explanation of its action:

"On Dec. 14, 1925, upon petition filed on behalf of the steam railroads operating in Ohio, the commission instituted a proceeding, No. 17,878, rates on iron and steel articles, in carloads within Ohio, to determine whether the rates on iron and steel articles, in carloads, in Ohio cause any undue or unreasonable advantage, preference, or prejudice as between persons or localities in intrastate commerce on the one hand and interstate or foreign commerce, on the other hand, or any undue, unreasonable, or unjust discrimination against interstate or foreign commerce. The commission has also pending a general investigation, No. 17,000, rate structure investigation, which includes among others, all of the rates assailed in those proceedings. It has concluded to assign for hearing No. 17,000 insofar as it covers the interstate rates on iron and steel articles in carloads, between points within official territory.

"No decided cases relating to rates on iron and steel articles have been reopened, but this will not preclude the commission from reaching conclusions different from those determined in prior cases if such action seems warranted."

Mileage Basis Reaction Broad

While no specific reference is made to it, the decision in the so-called Jones & Laughlin mileage case has been a disturbing factor in the rate situation in the western reaches of official territory. Primarily this case realigned rates from Pittsburgh and Chicago to St. Louis and southwestern territory. The effect has been to cause adjustment of many intrastate rates. Revised rates from Chicago to St. Louis necessitated changes from Chicago to points in Illinois, the Mississippi river crossings, Indiana, Wisconsin and Iowa. The intrastate rate situation in Indiana has not yet been entirely cleared up.

Buffalo producers of iron and steel have been contending that the new rate structure is prejudicial to it in that it accords preference to Pittsburgh district producers in shipments westward while heretofore Buffalo and Pittsburgh have been largely on a parity. The feeling at Buffalo that freight rates on iron ore from lower lake ports to Pittsburgh districts are too low compared with the rates on coal and coke from the Pittsburgh district to lake port destinations has never downed despite an adverse decision from the commerce commission five years ago.

Will Light New 800-Ton Blast Furnace

Blast will be applied to the new 800-ton blast furnace of the Weirton Steel Co., Weirton, W. Va. this month, according to officials of the company. The No. 1 stack of the company, which was first operated in July 1919, is rated at 600 tons and with the new stack will give the company a daily output ranging from 1600 to 1700 tons. Coke for the new stack will be supplied from 49 by-product coke ovens, which were completed Nov. 1. The complement of by-product ovens affords the production of about 1700 tons of coke daily. The new river docks, with equipment designed to handle 500 tons of coal an hour, received its first shipment this month. The new hot strip mill, now under construction, is expected to be scheduled next March. Construction of a new seamless tube mill will be started, it is understood, following the completion of the strip installation. Preliminary work on the tube mill now is under way. Within the next week No. 10 open hearth will be completed, which is the third of four new furnaces of 250 tons capacity. With all open hearths in operation the company will have an annual ingot capacity of 1,000,000 tons.

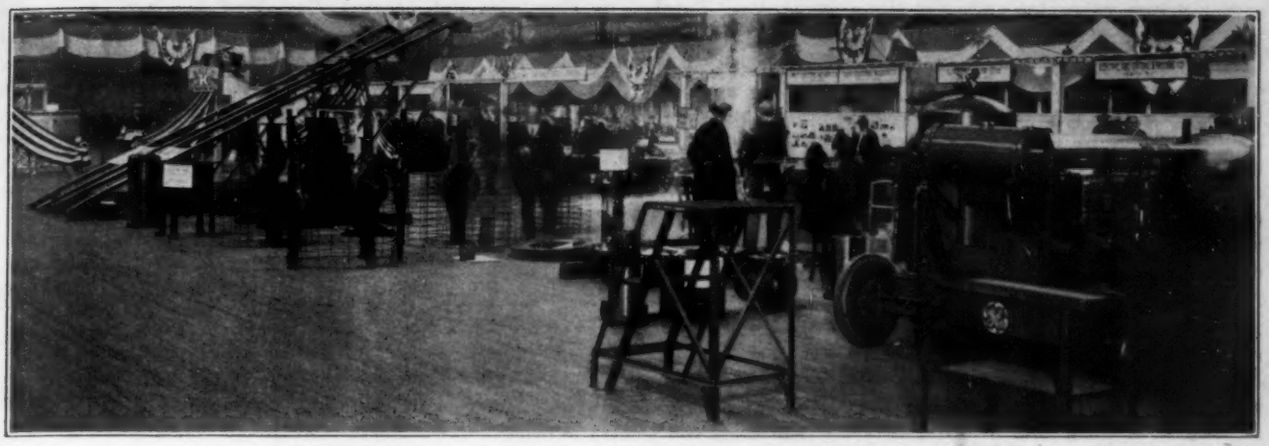
Denies Relationship to Canadian Company

The Hillman Coal & Coke Co., a Pennsylvania corporation having its principal office in Pittsburgh, announces that the Hillman Coal & Coke Co., a corporation under the laws of the province of Ontario, with its principal place of business in Toronto, Ont., which company recently became insolvent, is not a subsidiary of the Hillman Coal & Coke Co. of Pennsylvania, has no connection whatsoever with the latter company, and further, that no officer, director or stockholder of the Pennsylvania company has or ever had any interest whatsoever in the Canadian company.

Bureau Lauded for Tax Depreciation Study

Washington, Nov. 23—Following announcement by the internal revenue bureau that it will make a scientific study of the iron and steel industry with a view to setting up standard rates of depreciation for tax purposes, the department of manufactures of the chamber of commerce of the United States urges other lines of industry to facilitate the work of the bureau by making similar studies on their own initiative. The bureau's action is described as a "most progressive step."

Employment in shops represented by the National Metal Trades association in September totaled 634,780, or only 1251 less than in August, and 6582 more than in July.



The central floor area of Broadway auditorium was devoted to a general display of products and materials fabricated by welding. In the background at the left are several roof trusses constructed by the blow torch

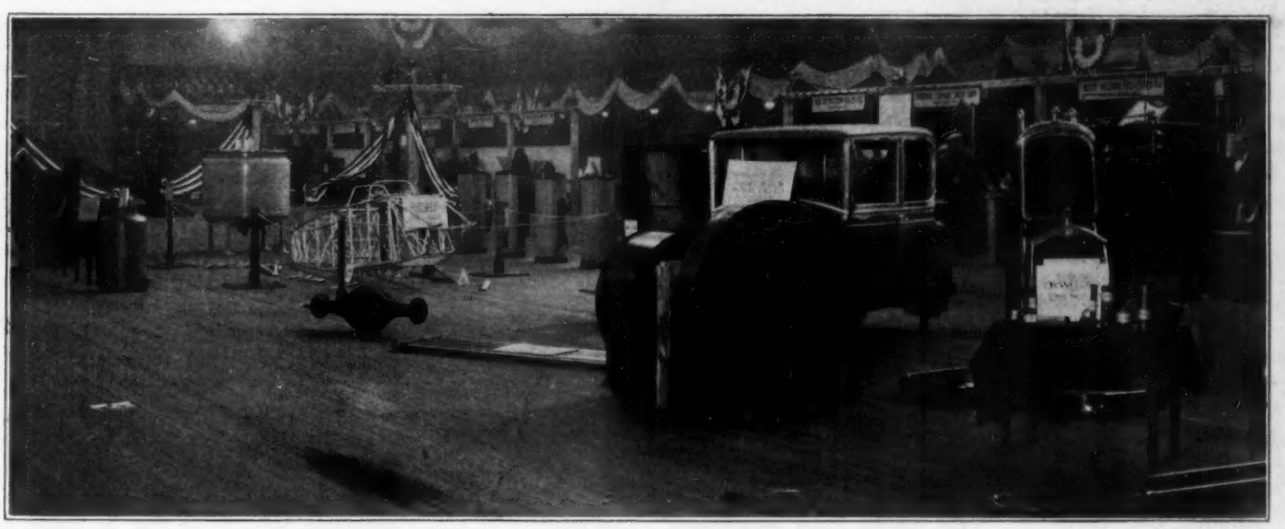
Exposition Emphasizes Progress of Welding and Cutting

WELDING as a method of joining metals together has been employed only a few years, but in that short time a new industry has been developed and today is performing an important function in the country's manufacturing. To demonstrate the progress of this industry was the purpose of the International Welding and Cutting exposition held at the Broadway auditorium, Buffalo, during the fall meeting of the American Welding society, Nov. 16-19, and that purpose was most convincingly fulfilled. More than 40 manufacturers of welding and cutting equipment and accessories were represented with exhibits many in operation.

To the layman, probably the most interesting feature of the exposition was a general display which occupied the entire central area of the auditorium. This display consisted of a wide range of finished and partially finished products fabricated by means of the electric arc, gas or thermit methods of welding. Included among the products were a chrome-molybdenum airplane fuselage, automobile body, automobile radiators, automobile transmission and axle housings, shop tables and stepladders, chairs, piping and valves, concrete reinforcing, steel mill rolls, all sorts of containers, tanks, roof trusses, boiler and condenser tubes, blower housings, repaired gears and many other products.

Not only did these products demonstrate the present practical applications of welding but they suggested new applicatione which might prove economical. In addition to the various products shown in the general educational display, nearly every exhibitor had examples of welded products at his booth, thus last week's exposition was without question the most complete which has been held in this country.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., had at its booth several types of electric arc welders, including one automatic unit and one portable unit. This company also showed specimens of arc welded structural steel. Buffalo Gasolene Motor Co., Buffalo, displayed two gasolene



THIS VIEW SHOWS ADDITIONAL APPLICATIONS OF WELDING. STANDING OUT MOST PROMINENTLY ARE THE AUTOMOBILE BODY AND THE AIRPLANE FUSELAGE AT THE LEFT. BOOTHS OF THE EXHIBITORS ARE TO BE SEEN IN THE BACKGROUND

engine driven generator units for electric welding. Truck Equipment Co., Buffalo, had in operation in a booth an overhead type of arc welder. The company also showed a steel truck body fabricated by welding and several axle housings. General Electric Co., Schenectady, N. Y., exhibited in operation a double-head high-speed tank welder, two portable welders and specimens of welds.

Alternating and direct-current arc welders, transformers and generators, and a gasoline-electric welder mounted on a railroad truck constituted the equipment shown by the Electric Arc Cutting & Welding Co., Newark, N. J. Swift Electric Welder Co., Detroit, operated a resistance butt welder, while Burke Electric Co., Erie, Pa., operated portable and stationary direct-current welders. The latter also displayed shields, guards and other equipment. Three resistance welders, including one seam and two spot, were demonstrated by Gibb Welding Machines Co., Bay City, Mich.

Thomson Electric Welder Co., Lynn, Mass., showed an electric spot welder and samples of work done on the machine. At the booth of the Una Welding & Bonding Co., Cleveland, was shown a portable arc welder, welding rods, specimens of welded structural steel and eye shields. A portable direct-current welder and a line of motors built by welding were exhibited by the Northwestern Mfg. Co., Milwaukee. Allan Mfg. & Welding Co., Buffalo, demonstrated a portable spot welder suspended from overhead, transformers, electrode holders, shields and other accessories. Butt and spot welders were shown in operation by the Federal Machine & Welder Co., Warren, Co. The U. S. Light & Heat Corp., Niagara Falls, N. Y., showed a tractor driven direct-current welder, an alternating portable outfit and one direct-current welder.

Much Gas Equipment Shown

One of the largest exhibits was that of the Oxweld Acetylene Co. and associated companies, Long Island City, N. Y., this display consisting of carbide, welding and cutting torches, gages, tanked gases and other products. Welding and cutting demonstrations were given. Torchweld Equipment Co., Chicago, also displayed gas welding equipment, tanks, gages and torches. Welding rods, torches, gages, reducers and similar apparatus comprised the exhibit of the Purox Co., Denver.

At the booth of the Alexander Milburn Co., Baltimore, were shown torches, gages, regulators and other equipment including an acetylene generator. Torches, welding wire and supplies were exhibited by James E. Ferguson Co., Buffalo. Carbide constituted the exhibit of the Shawinigan Products Corp., New York; while the display of the Metal & Thermit Corp., New York, consisted chiefly of samples of welds made by the thermit process. Air Reduction Sales Corp., New York, had an interesting display consisting of oxygen and acetylene in tanks, a cutting machine and tank welder in operation and a demonstration of pipe welding. A water heater made by gas welding attracted attention.

An acetylene generator was shown in the booth of the Carbic Mfg. Co., Duluth, while Endress Mfg. Co. Inc., Cortland, N. Y. exhibited gas torches and gages. Gas torches, portable tools, welding rods and mill supplies made up the display of Beals, McCarthy & Rogers, Buffalo. Root Neal & Co., Buffalo, also showed welding rods, gas welding supplies, electric tools pulleys, valves, drills, cutters, transmission equipment and bearings.

Included in the exhibitors of welding wire, rods and electrodes was Acheson Graphite Co., Niagara Falls, N. Y., which showed graphite electrodes. Wickwire-Spencer Steel Co., New York, exhibited at its booth welding wire and rods as did the Page Steel & Wire Co., Bridgeport, Conn. Welding rods were shown by the Transportation Engineering Corp., Brooklyn, N. Y., a product also shown by Alloy Welding Processes Ltd., London. The latter demonstrated the use of the rods and exhibited specimens of work done.

John A. Roebling's Sons Co., Trenton, N. J., attracted attention to its display of a miniature railway welding shop showing a workman making an arc weld. In a similar display wire rope slings made by the company were shown raising and lowering a locomotive. The company manufactures welding wire. Bronze welding rods were shown by the American Brass Co., Waterbury, Conn., with a demonstration of use of the rods in gas welding.

Industrial goggles, respirators, welding helmits and handshields were shown by Wilson Goggles, Inc., Reading, Pa. Buffalo Forge Co., Buffalo, had on display at its booth forge fans, a shear and punch, a T and angle bender, a drill press and a shear and a ring rolling machine. Crouse, Hinds Co., Syracuse, N. Y., had an extensive display of nonarcing plugs and receptacles. Sherwood Mfg. Co., Buffalo, exhibited a line of brass and bronze valves while the King Refractories Co., Buffalo, had a photographic display of refractories and their manufacture. Bearing metals for various applications were shown by Bearium Bearings Inc., Buffalo. At the booth of the Niagara Falls Power Co., Niagara Falls, N. Y., a workman was engaged in welding with a bronze rod an impeller wheel.

Welding Processes More Widely Applied

(*Concluded from Page* 1366)

practical. Chairman Adams further emphasized the last point, stating that the measurements are difficult to make as variations are extremely small. J. H. Edwards, chairman of the structural steel committee reported that at a meeting on Wednesday evening his committee was completely organized and subcommittees appointed to investigate the subject.

E. M. T. Ryder, way engineer, Third Avenue railway, New York, and a member of the welded rail joint committee reported that although bus transportation is growing it is the opinion of railway engineers that electric car transportation is the most ecomical method for handling masses and will be used for some time to come, consequently work on welded rail joints is progressing as rapidly as possible. Mr. Spraragen submitted a proposed program for the investigation pressure welded vessels, a research in which the welding bureau is co-operating with the American Society of Mechanical Engineers. In this connection, J. W. Owens suggested that it might be advisable to consider the effect of heat treatment of welds.

At the final technical session on Friday morning two papers were presented, both dealing with electric arc welding in a gaseous atmosphere. One paper, "Oxidiation of the Arc Crater," was read by P. P. Alexander, research engineer, General Electric Co., Lynn, Mass.; and showed the effect of various atmospheres on the nature of an arc weld. This paper is presented in full on page 1360 of this issue of IRON TRADE REVIEW. The other paper, "Welding with the Atomic Hydrogen Flame," was presented by R. A. Weinman, research engineer, General Electric Co., Schenectady, N. Y. The author described the method of applying the electric arc in an atmosphere of hydrogen and the nature of welds obtained. Mr. Weinman stated that results attained in the laboratory clearly indicated that welds can be made by this method which cannot be made by any other known means.

Founders Discuss Economics

Wide Range of Topics Feature Convention of National Association—Five-Day Week Bobs Up in Addresses—Apprentice Training Increasing— No Action Taken on Placing Castings Weights on Blueprints

INDUSTRIAL education problems, tax relief and cost accounting received special attention at the thirtieth annual convention of the National Founders' association, Hotel Astor, New York, Nov. 17-18. Combined with these for a well balanced program were discussions of labor conditions, business economics, waste in industry, the general industrial situation here and abroad, and certain phases of plant design. More than 200 attended.

That business in the foundry industry is substantially better than a year ago was brought out in the annual address of President William H. Barr, which was devoted largely to a review of the association's activities over the 30 years of its existence. Satisfactory labor conditions also were indicated by Commissioner A. E. McClintock, who reported that there were only three strikes at member plants, involving a total of 149 molders, in the past year. Discussing conditions in the molders' union, the commissioner declared that the membership of the organization, based on dues received, was 28,000, practically the same as the previous year.

Furtherance of co-operative effort between farmers and manufacturers was indicated by the passing of a resolution urging its continuance and by receipt of a telegram from the National Grange in convention at Portland, Me., voicing virtually the same sentiments. The National Founders also passed a resolution calling upon the association to co-operate with other organizations with a view to obtaining further tax relief.

The annual banquet, presided over by James A. Emery, counsel of the association, was featured by an address entitled "The World and its Ways in 1926—A Birdseye View of Present Day Conditions in Europe" by K. V. Kaltenborn, associate editor of the *Brooklyn Daily Eagle*, Brooklyn, N. Y.

William H. Barr, Buffalo, was re-elected president of the association, and W. A. Griswold, of the Gray & Dudley Co., Nashville, Tenn., was elected vice president to succeed L. R. Clausen, of the J. I. Case Threshing Machine Co., Racine, Wis. A. E. McClintock, Chicago, was reappointed commissioner and J. M. Taylor, also of that city, secretary. The Chicago Trust Co., Chicago, was appointed treasurer of the association.

Strong Plea Made for Public Economy

AN ADDRESS by James A. Emery, strongly advocating further tax relief and reform, was one of the highlights of the convention. With all his characteristic vigor and eloquence, the speaker pointed out what he believed to be fallacies in the present tax system and suggested several corrective measures. Mr. Emery urged the association to demand adequate provision for the submission of bond issues to the people, limit the capacity of the state government to get into debt and undertake to confine the life of necessary bond issues to the life of the improvement against which they issue; secondly to urge the adoption of an effective budget control of appropriation and expenditure, and to develop a demand for the adoption, wherever practicable, of pay-as-you-go policy.

He further urged that the association present in each case, through an effective committee, information with respect to local indebtedness and expenditures and help to create a tax consciousness that will serve to check immediate extravagance and expenditures; also, to start an examination of local boards and commissions to abolish the unnecessary, avoid duplication of effort, secure curtailment of expenditure and improve administrative efficiency.

Mr. Emery laid special stress on the necessity for corporate tax relief. Compared with taxes on individuals, sole proprietaries and partnerships, corporate taxes were unequitable, he declared, and they stand in the way of progress and general business and industrial development.

Tax Relief Would Be Widespread

Relief in this direction, he said, would not affect a small minority, but a great number of persons. Conservatively, there are more than 19,000,000 shareholders throughout the country. From this known number, even allowing for duplications, there are approximately four times as many shareholders of corporations who will be subjected to a 13½ per cent tax on the profits of their shares in 1926 as there will be individual taxpayers.

Between 85 and 90 per cent of the country's production and service is performed by business in corporate form. He then added that no more than two-thirds of these corporations have ever shown a net income at any one time. He urged a program that would lead to the repeal of the additional one-half of 1 per cent levied on corporation income and becoming effective in 1926.

That the 5-day week will come eventually was the prediction of M. C. Rorty, vice president, International Telephone & Telegraph Co., New York, in an address entitled, "Practical Business Applications of Economic Studies."

"I suspect that some day we shall have a 5-day week," the speaker declared. "During the past few years, we have been using our increased per capita income for the purchase of automobiles, radio sets, motion picture tickets and improved housing. But, sooner or later, I imagine we shall divert much of our increased productive efficiency to the purchase of greater leisure. To a considerable extent we have done this already, and the tendency probably will increase as time goes on.

"It is of interest to note that the demand for the shorter week is coupled with the suggestion that our production normally tends to outstrip our power of consumption and that we must raise wages arbitrarily to create consuming power, and must provide added leisure that we may find new ways of spending our money.

The facts of the case are quite to the contrary. Under normal conditions, there could never be any general overproduction of useful goods. Consumption tends automatically to balance any normal development of production, no matter how great such development may be."

Discussing present day business conditions, the economist declared that there may be a slight tendency downward over the next 12 months. The accumulated shortage of buildings has been largely, if not wholly, eliminated. But there are no signs of more than a moderate slowing up in the rate of new construction. Industry generally is active, he continued, but without signs of over-expansion which would forecast a radical depression. Prices, in particular, are showing no signs of skyrocketing.

The flow of money from this country for foreign loans and investments, the speaker continued, appears to be sufficient to prevent any serious adverse trade balance. The farmers will tend gradually to turn toward free trade and their efforts to secure lower tariff may be seconded by those manufacturing groups which are interested in export trade; however, no harm will come from this move, Mr. Rorty declared, if manufacturers as a whole will seek to regulate tariff reduction within sane limits rather than to oppose them entirely.

Referring again to the reduced working period, Mr. Rorty said that among more recent economic fallacies is the claim that, if the 8-hour day or the 44-hour week is not made universal, those nations which adopt it cannot compete in the world markets with nations which maintain longer working hours. He said the facts of the matter are that in the long run each nation produces those things that it can produce most effectively and if it must sell them in the world's market, it does so at the world market price and lives on the proceeds.

Apprentice Training Increasing

That the industrial education activities of the association are bearing fruit, is reflected in the report of the committee in charge of the work. During the last two years, the number of young men being trained as molders and coremakers, has been increased 140 per cent. The number of centers in which foundry apprenticeship programs are operating and the number of public school centers co-operating in this training has shown a growth of about 100 per cent.

Schools and colleges have shown increased interest in foundry instruction, according to the report. Sixty-four educational institutions, including universities, colleges, high schools, trade schools and continuation schools, are offering foundry instruction to 2805 students. While the majority of the students are in engineering courses, and are not expected to become molders or even foundry foremen, it is believed that contact with foundry processes will react favorably to the industry. Plans are under way for standardization of foundry instruction in high schools and trade scholos.

Foremanship training, according to the report, has expanded as a variety of agents, including federal and state bureaus, colleges and city schools, have become interested. While more attention thus far has been given to details of plant operation, and aims to make foremen more effective in giving orders, directions and suggestions, the committee believes that additional attention should be given to training foremen to become efficient handlers of workmen. The technical and general education aspects of foreman training thus far, have been overstressed it is believed.

L. A. Hartley, director of industrial education for the association, spoke interestingly on the subject, using charts and statistical tables. The speaker believed it would be a long time, fully 20 years or more, before schools and colleges will be in a position to furnish foundries with properly trained foremen. Consequently, he declared, foundrymen, while fostering the development of training in the schools, should rely largely on their own efforts.

E. T. Runge, cost consultant for the association, discussed practical foundry cost methods. "The Patent System: What It Means to Industry and How It May Be Improved" was the subject of an address by Thomas E. Robertson, commissioner of patents, Washington. R. M. Hudson, chief of the division of simplified practice, department of commerce, outlined what is being done for the elimination of waste in industry. In reinforcing bars he stated that specifications have been reduced from 40 to 11 by 85 per cent of the industry. The annual saving to the industry is estimated at $4,500,000.

Discussion brought out that many members of the Founders' association are favorable to the idea of placing casting weights on blue prints. Some objections were voiced and until further study can be made, the association is not likely to give formal approval.

"Natural Light and Ventilation in the Foundry," was the subject of a brief address by Clarke P. Pond, vice president, engineering-sales, David Lupton's Sons Co., Philadelphia. By aid of charts, he traced the development of modern foundry construction with improved light and ventilation. W. H. Rademacher, Edison Lamp Works of the General Electric Co., Harrison, N. J., described modern artificial lighting methods. He declared that on an average proper lighting has led to an increase of 10 per cent in production at an increased cost of only 1 per cent of the amount of the payroll. Referring to industrial accidents, the speaker stated that one out of eight may be directly attributed to poor light.

October Develops Gain in Employment

Washington, Nov. 23.—Employment in October was 0.2 per cent greater than in the same month of last year, and payroll totals were 2.5 per cent greater, 24 of the 54 industries showing increased employment, and 31 industries, increased payroll totals, according to the bureau of labor statistics, department of labor. The outstanding gains over the 12 month period were in metal industries, iron and steel, structural ironwork, foundry and machine shop products, machine tools, and steel shipbuilding.

The bureau states that employes' earnings showed a decided improvement in 42 industries. Per capita earnings in all industries combined increased 3.4 per cent in October, compared with September. In October 7608 establishments reported an average of 98 per cent of full time operation, and an average of 88 per cent of a normal full force of employes.

Is Awarded Navy Steel

Washington, Nov. 23.—Joseph T. Ryerson & Son Inc., Chicago, has been awarded the contract by the navy department for furnishing 343 tons of medium steel plates for the reconditioning of the U. S. S. WYOMING at $15,915.20, bids for which were received on Nov. 10.

Drop Hayes Complaint

Washington, Nov. 23.—Federal trade commission has dismissed its complaint against the Hayes Wheel Co., Jackson, Mich. The company was charged with having acquired all of the outstanding common capital stock of the Imperial Wheel Co. in alleged violation of the Clayton act.

Industrial Men in the Day's News

Gerard Swope, Head of New National Electric Manufacturers' Association

FROM a dollar a day helper to head of a great corporation he has displayed a determination and energy which could not be denied success.

TRAINED technically in college and in his early association with the electrical industry, his greatest accomplishments and successes have been in developing administrative and distributive phases of his business.

HORSEBACK riding is one of his chief recreations. Golf takes too much time. Music also is one of his diversions. His masterful concentration allows him to work at high pressure or relax completely at will.

CONCENTRATION and a definiteness of purpose are some of the dominant characteristics contributing to the success of Gerard Swope, president of General Electric Co., Schenectady, N. Y., and recently elected head of the National Electric Manufacturers' association as announced in IRON TRADE REVIEW, Oct. 14. The newly formed electrical organization will control distribution of products reaching a total value of $1,500,000,000 annually. Its formation follows the merging of Electric Power club, the Associated Manufacturers of Electrical Supplies and the Electrical Manufacturers council. The new association is composed of 270 leading electrical manufacturers and has for its purpose the advancement of the art of manufacturing adequate and reliable electrical equipment.

In discussing the new association, Mr. Swope said, "Co-operation with the other national electrical organizations will be more effective in the new organization because of its unity, which should lead to a wider use of electrical apparatus, and therefore of electricity, which will be conducive to greater comfort and convenience in the home and increased efficiencies in the workshops."

Mr. Swope's industrial career has been typical of that which led to the development of the term, "self made man." His interest in electricity and its applications dates back to his boyhood days, when one of his chief delights was to spend hard earned money in experimenting. At the age of 17 he built an electric motor, but his real identification with the industry came in 1893 when he entered the employ of the General Electric Co. as a helper at $1 a day. He did not enter the electrical field without knowledge, however.

He was born in St. Louis, Dec. 1, 1872, and lived there until 19 years old. Following his high school education, he went to Massachusetts Institute of Technology at Boston where he took a course in electrical engineering. Because of his university training he was forced to sell himself to the foreman and superintendent at the Western Electric Co. who couldn't comprehend why with a college education he should want to soil his hands with manual labor. But he entered into the new work with his customary enthusiasm and before long had been transferred to the engineering department where he had an opportunity to put into practice some of the theories he had learned at college. It was not many months before he had begun to attract attention of other departments, but he refused to be diverted from his objective and turned down offers of more attractive and more remunerative positions.

He suggested the establishment of a branch office in St. Louis, and this having proved successful, executives of the company transferred Mr. Swope to the commercial department. Here he proved his ability in sales. Shortly afterward he was sent to St. Louis as branch office manager. His success in administration of that office and his productivity from the territory around St. Louis led to the organization of a branch company there of which Mr. Swope was elected president. This at the age of 29 years. He began to attract attention of other companies in different fields, but concentrated on his goal which was the electrical industry. When Harry B. Thayer was made general manager of the Western Electric Co., Mr. Swope went East as general sales manager, making his headquarters in New York.

Mr. Swope resigned from the Western Electric Co. during the war to join the general staff at Washington as assistant director of purchase, storage and traffic, under General Goethals. His devotion to his duties, often involving 12 to 14 hours a day work, won for him the dis-

tinguished service medal of the United States, and the award of chevalier of the legion of honor by France. When he left the government service he became president of the International General Electric Co., foreign distributive unit of the General Electric Co.

After three years in this capacity, in May, 1922, he was made president of the General Electric Co., at the same time that Owen D. Young was made chairman of the board and E. W. Rice, honorary chairman.

In addition to his General Electric affiliation he is a director of the British Thomson-Houston Co., Ltd., London; Compagnie Francaise Thomson-Houston and other companies. Mr. Swope is a fellow of the American Institute of Electrical Engineers and a member of various scientific and technical societies. He belongs to the Bankers, Engineers, India House, Lotos, Metropolitan and Technology clubs of New York, Mohawk, Mohawk Golf club, Schenectady, N .Y., and Sleepy Hollow Country club of Scarborough, N. Y.

Mr. Swope obtains his physical recreation in horseback riding. He claims that golf takes too much time for a busy executive. He is an outdoors man, however, and enjoys the companionship of his four boys in such recreation. Mr. Swope has long been interested in civic and community activities, for many years being prominent in St. Louis projects. He is a trustee of the corporation of Massachusetts Institute of Technology and a director of Greenwich House in New York.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

CHARLES A. MOFFETT, president of the Gulf States Steel Co., Birmingham, Ala., has resigned from that office to become chairman of the Alabama board of control and economy under Governor B. Groves. Mr. Moffett went with the Southern Iron & Steel Co. in 1909 and later was with the Gulf States company as works manager at Alabama City. In 1916 he was vice president and general manager of all plants. In the reorganization of 1921 he became president.

Leslie Geohegan, general manager, for 17 years with the company and its predecessors, has been named vice president and operating manager.

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H. B. Van Sinderen, vice president of C. Tennant Sons & Co., 19 West Forty-fourth street, New York, is on a trip to Europe.

* * *

Walter C. Rott, formerly with S. R. Smythe Co. and Julian Kennedy, consulting engineers, has joined the furnace division of the Rust Engineering Co., Pittsburgh, effective Nov. 15.

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Frank R. Huston, recently made vice president of the American Steel Export Co., New York, formerly was vice president in charge of operations for the Donner Steel Co., Buffalo.

* * *

Frank W. Jones, Philadelphia district sales agent for the Eastern Steel Co., Pottsville, Pa. has been elected president of the Steel Club of Philadelphia. John B. De Wolfe, district sales agent for the Trumbull Steel Co., Warren, O., was elected vice president and Frank J. Krause of Bethlehem Steel Co. was elected secretary-treasurer.

* * *

Thomas J. Litle, until recently chief engineer of the Lincoln Motor Car Co., Detroit, has been engaged as chief engineer of the Marmon Motor Car Co., Indianapolis. Mr. Litle is president of the Society of Automotive Engineers.

* * *

Arthur A. Fowler, president of Rogers, Brown & Crocker Bros. Inc., New York, returned Nov. 20 from a business trip to Europe.

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Roy D. Kerby, recently appointed general manager of the Durant Motors of Canada Ltd., has had 13 years of experience in the automotive industry, having been associated not only with the Durant organization but with General Motors of Canada Ltd., at Oshawa, Ont.

* * *

John F. Hazen, formerly general manager of sales of the Pittsburgh Steel Co., has joined the sales department of Bethlehem Steel Co., with headquarters at Bethlehem, Pa. He will specialize in wire products. Mr. Hazen became identified with the iron and steel industry in 1897. He entered the sales department of the Pittsburgh Steel Co. in 1902, since which time his activities have been devoted particularly to the sale of nails and wire products.

* * *

E. P. Gormely has been appointed general manager of the Haynes-Stellite Co., with headquarters at the plant of this company at Kokomo, Ind. He succeeds the late C. G. Chisholm. Mr. Gormely had been assistant works manager of the Union Carbide Co. with headquarters at New York. Both of these companies are subsidiaries of the Union Carbide & Carbon Corp.

* * *

Harold D. Mitchell has been appointed sales representative for western New York by William Ganschow Co., Chicago, manufacturer of gears. His headquarters will be at 1543 Fillmore avenue, Buffalo.

* * *

Gregory J. Comstock, formerly metallurgist of International Silver Co., Meriden, Conn., has been appointed director of research of the Firth-Sterling Steel Co., McKeesport, Pa. Mr. Comstock was graduated from the Sheffield scientific school of Yale university in 1917 with the degree of bachelor of philosophy, and served in the army from 1917 to 1919. After that he was assistant chemist for the American Hardware Corp. for a short time; becoming metallurgist of the International Silver Co. in 1920.

* * *

Owen K. Parmiter has been appointed metallurgical and sales engineer of the Firth-Sterling Steel Co., McKeesport, Pa. After Mr. Parmiter's graduation from the University of Pittsburgh in 1910, he was alloy and tool steel chemist with the Firth-Sterling Steel Co. for 3 years and then became assistant metallurgist. In 1918, he was appointed metallurgist in charge of all technical operations, which position he has held until his appointment as metallurgical and sales engineer.

Coal Miners Are Rushing Back

Final Settlement in Britain Expected To Be Reached This Week—District Agreements Being Signed—Furnaces and Mills Preparing To Resume—$97,000,000 Subway Contract Taken for Argentina

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Nov. 23—(*By Cable*)—Following the coal districts' rejection of the government plan for settlement of the strike, the delegate conference has recommended local agreements, with the executive issue and guiding principles different from those proposed by the government. A final settlement will not be reached until results of the recommendation are reported to the national conference Friday. This last move by the federation is not expected to retard a settlement.

While these maneuvers are being made the coal miners are rushing back to work. A five-year agreement between the owners and miners in the Nottingham district has been signed.

British iron and steel works are preparing to resume operations, but not much pig iron output is expected this year, and prices are uncertain. Everything depends on coal prices. Some Sheffield furnaces have accumulated coal stocks and expect to resume operation of their blast furnaces within a fortnight following the end of the strike.

The British engineering firm of Swan, Hunter has taken a contract for building a dock at Singapore to cost £1,200,000. A London engineering firm has obtained a £20,000,000 contract for constructing an underground railway in Argentina.

German mills report sales of rails for domestic use aggregating 800,000 tons. French makers have booked good tonnages of rails for shipment to Egypt and South Africa. A slackening in export demand is noted in Belgium.

British Steel Users Buy Less from Continent

LONDON, Nov. 15.—(*European Staff Service*)—Notwithstanding the continuation of the coal stoppage in Great Britain, iron and steel export business on the continent has slowed and prices are easier. It is apparent that for the present at any rate, the crest of the wave has been reached. However, a marked decline should not be expected as the continental steel entente has a stabilizing influence, while the Belgian franc is on a gold basis and the French franc has considerably appreciated.

British engineering firms are, however, booking some orders for export. Cammell, Laird & Co., Ltd., Nottingham, have received an order from the Central Argentine railroad for 800 25-ton all-steel bogie cars, and the Midland Railway Carriage & Wagon Co., Ltd., Birmingham, has received an order for seven first-class bogie dining-cars. The Federation of British Industries reports a number of interesting engineering orders for export to Brazil, Yugoslavia, Canada, Bolivia, Sudan, Western India, South Africa, Russia, China. Bolckow, Vaughan & Co., Ltd., Middlesbrough, were awarded an order for 4980 metric tons of flat bottom rails for the Egyptian state railroad. The Stanton Iron Works Co., Ltd., Nottingham, has booked export pipe.

Continental activities are evidenced by the fact that one month after its inception the steel entente decided to increase the annual rate of production on which the members' quotas are based. This is an abnormal situation entirely due to the British crisis. There are practically no more offerings for November. So to the

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 22	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$29.71	6 2 6*	$20.61	4 5 0	$20.61	4 5 0	$20.61	4 5 0
Basic	25.46	5 5 0	21.58	4 9 0	21.58	4 9 0	20.61	4 5 0
Basic-bessemer	27.89	5 15 0†	17.58	3 12 6	17.58	3 12 6	18.19	3 15 0
Hematite, Phosphorus 0.02-0.05	26.07	5 7 6	26.49	740*	.....	.....	21.34	4 8 0
SEMIFINISHED STEEL								
Billets	$32.74	6 15 0	$25.46	5 5 0	$25.46	5 5 0	$25.25	5 0 0
Wire rods	43.65	9 0 0	29.71	6 2 6	29.71	6 2 6	29.71	6 2 6
FINISHED STEEL								
Standard rails	$38.80	8 0 0	$29.10	6 0 0	$29.10	6 0 0	$29.10	6 0 0
Merchant bars	1.73c	8 0 0	1.24c	5 12 6	1.24c	5 12 6	1.32c	6 0 0
Structural shapes	1.46c	6 15 0	1.24c	5 12 6	1.24c	5 12 6	1.29c	5 17 0
Plates, ship, bridge and tank	1.68c	7 15 0	1.38c	6 5 0	1.38c	6 5 0	1.54c	7 0 0
Sheets, black, 24 gage	2.38c	11 0 0	2.53c	11 10 0	2.53c	11 10 0	2.42c	11 0 0
Sheets, galvanized, 24 gage, corrugated	3.84c	17 15 0	4.48c	2,800*	7.02c	3,900*	2.04c	9 5 0
Bands and strips	2.38c	11 0 0	1.51c	6 17 6	1.51c	6 17 6	1.54c	7 0 0
Plain wire, base	2.11c	9 15 0	2.56c	1,600*	1.57c	7 2 6	1.54c	7 0 0
Galvanized wire, base	2.76c	12 15 0	3.36c	2,100*	2.04c	9 5 0	1.93c	8 15 0
Wire nails, base	2.06c	9 10 0	2.88c	1,800*	1.73c	7 17 6	1.67c	7 12 0
Tin plate, base box 108 pounds	$ 5.70	1 3 6	.....	....	.....	.....	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$29.71	6 2 6	$21.48	600(2)	$26.46	675	$19.55	85
Basic pig iron	25.46	5 5 0	21.11	590(1)	25.48	650	20.24	88
Furnace coke	13.34	2 15 0	6.95	194	9.02	230	4.95	21.50
Billets	32.74	6 15 0	29.18	815	30.56	800	26.47	119
Standard rails	1.84c	8 10 0	1.44c	900	1.80c	1,000	1.46c	140
Merchant bars	1.89c	8 15 0	1.44c	900	1.85c	1,025	1.40c	134
Shapes	1.68c	7 15 0	1.36c	850	1.76c	975	1.37c	131
Plates, ship, bridge and tank	1.92c	8 17 6	1.57c	980	2.07c	1,150	1.55c	149
Sheets, black, 24 gage	2.49c	11 10 0	2.92c	1,825	3.78c	2,100	2.35c	225
Sheets, galvanized 24 gage, corrugated	3.79c	17 10 0	4.40c	2,750	7.02c	3,900	3.65c	350
Plain wire	2.11c	9 15 0	2.56c	1,600	2.70c	1,500	2.03c	195
Bands and Strips	2.49c	11 10 0	1.84c	1,150	2.16c	1,200	1.62c	155

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £2 15s 0d ($13.34) f. o. b. Ferromanganese £16 0s 0d ($77.60) f. o. b. German ferromanganese £15 10s 0d ($75.18) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

booked-up condition of the mills is added the congestion of ports such as Antwerp or Rotterdam. Certain English buyers complain of deliveries that have been delayed for months in Antwerp. The shortage of pig iron on the international markets will, if continued, cause French producers to blow in additional furnaces. Should the rate of the franc remain at about 150 to the pound sterling, the present export prices will lose some of their allurement; foundry pig iron at £3 15s ($18.20) f.o.b. Antwerp corresponds today to about 560 francs, whereas the quotation in the domestic market is 600 francs per ton f.o.b. furnace. In the case of elgium, with the franc stabilized at 175 to the pound, export business still is enticing for the moment. The Belgians have enjoyed a good demand from America for concrete reinforcing bars. Belgian and French merchant bars have dropped from £5 15s ($27.80) a week ago to £5 13s ($27.45), whereas the Germans quote £5 12s ($27.25) with shorter delivery periods. Undoubtedly Germany is enjoying a period of activity in export markets. It is reported that the Skoda works in Czechoslovakia have received important orders for turbines from Russia. Other Slovakian works have also been awarded contracts for turbines and boilers for the same destination.

Rise of Franc Checks Steel Prices

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance

PARIS, Nov. 15.—(*European Staff Service*)—The rapid rise of the French franc has checked the upward trend of iron and steel prices. Following the stabilization of Belgian exchange industrialists are expecting similar steps to be taken in France. Price adjustments will undoubtedly be necessary when the government announces at what rate it intends to fix the exchange. In the meantime businessmen are exercising great caution to avoid heavy commitments.

Domestic buying has been slowed considerably in anticipation of price reductions. Furnaces and mills, however, are booked well ahead and there has been no break in prices. The French iron and steel industry is traversing what otherwise might be a critical period, were it not for the coal stoppage in England. Export business with England has been unusually heavy since last May. Moreover, many of England's foreign customers have turned to the continent for their requirements.

Franc—$0.03

Directors of the European steel entente have increased the tonnage to be distributed to the participants during the fourth quarter to 8,000,000 tons.

French blast furnaces produced 785 000 tons of pig iron during September, compared with 813,500 tons in August, a record for all time. The minimum export price of foundry No. 3 remains unchanged at £3 15s ($18.20) f.o.b. Antwerp. Domestic tonnage is ceded to founders at 600 francs ($18.00). Hematite pig iron brings 730 francs ($21.90) f.o.b. furnace.

Export inquiry for steel products is heavy. Prices are firm. Merchant bars continue to bring from £5 13s to £5 15s ($27.40 to $27.80) f.o.b. Antwerp. French mills quote domestic tonnage at 900 francs ($27.00) base f.o.b. mill. Shipments during the past month have been considerably larger than bookings, but deliveries still are extended.

Europe Makes Steel Adjustment

LONDON, Nov. 15.—(*European Staff Service*)—A message from Berlin gives the various quotas of production allotted to members of the continental steel entente, and percentages of the respective countries for different rates of annual production. These figures are shown in the accompanying table. It will be noted that the percentages which were indicated in IRON TRADE REVIEW of Oct. 21 apply to an annual rate of production of 30,000,000 metric tons or over. Below this annual rate the percentages vary between small limits. The concession to Belgium for the initial annual rate of production is plainly shown by the fact that whereas Belgium's final percentage for a production of 29,000,000 tons is 11.56 per cent, that country was granted a percentage of 12.57 per cent for the initial total annual output of 25,287,000 metric tons. It will also be seen by the table that it was Germany's percentage which was most reduced in proportion. Since the directing committee of the entente has recently decided to increase the annual rate of production for the present quarter to 32,000,000 metric tons, the final percentages now come into play, and the quotas for the present quarter are thus indicated in the last section of the table. It is to be noted that Belgium and Germany have practically reached an output corresponding to their quota on the combined annual base rate of 32,000,000 metric tons.

The *Usine* of Paris, quotes from the *Frankfort Gazette* the following information relating to the recent agreement between France, Luxemburg, Germany and the Saar for the exchange of pig iron.

The tonnage of pig iron that will be imported from Luxemburg and Lorraine into Germany will be based on the average imports of recent years. The tonnages will be calculated for monthly or quarterly periods. It is expected that from 10,000 to 15,000 tons of pig iron will enter Germany each month, while about 75,000 tons of steel per month also will be imported from Luxemburg and Lorraine into Germany.

Entente Steel Division

	Metric tons	Percentage
Annual output	25,287,000	
Germany	10,227,000	40.45
France	8,066,000	31.89
Belgium	3,180,000	12.57
Luxemburg	2,160,000	8.55
Saar	1,654,000	6.54
Annual output	26,287,000	
Germany	10,712,000	40.75
France	8,454,000	32.16
Belgium	3,210,000	12.21
Luxemburg	2,257,000	8.60
Saar	1,654,000	6.28
Annual output	27,287,000	
Germany	11,342,000	41.57
France	8,726,000	31.98
Belgium	3,240,000	11.87
Luxemburg	2,325,000	8.52
Saar	1,654,000	6.06
Annual Output	28,287,000	
Germany	12,147,000	42.94
France	8,850,000	31.28
Belgium	3,280,000	11.60
Luxemburg	2,356,000	8.32
Saar	1,654,000	5.86
Annual output	29,287,000	
Germany	12,644,000	43.18
France	9,132,000	31.18
Belgium	3,385,000	11.56
Luxemburg	2,431,000	8.30
Saar	1,695,000	5.78
Annual Output	32,000,000	
Germany	13,820,000	43.18
France	9,980,000	31.18
Belgium	3,700,000	11.56
Luxemburg	2,650,000	8.30
Saar	1,850,000	5.78

The tonnage of pig iron that will be furnished to the Saar district. About 45 per cent will be furnished by Germany and the remainder by France.

The importation of other grades of pig iron from the Saar district into Germany is not foreseen, as the Saar consumes the greater part of its production. However, should it be desired to ship Saar pig iron into Germany the tonnages will be deducted from the quotas of France and Luxemburg.

The present agreement has no bearing on the possibility of the Saar plants being later members of the German union. It is not expected that this agreement will have any marked influence on world prices, and it has no effect of limitation on the production of pig iron. Belgium remains outside the agreement.

The *Usine* adds that the tonnage of pig iron which will be imported from France and Luxemburg into Germany is divided in the proportion of seven for France and three for Luxemburg.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

JOHNSON STEEL & WIRE CO. recently has been organized at Worcester, Mass., with Charles B. Johnson, president and general manager, George E. Peace, vice president and assistant general manager, B. A. Johnson, treasurer, George G. Johnson, assistant treasurer, and E. L. Anderson, clerk. The Johnson brothers are the third generation of wire makers. They were formerly stockholders of the Worcester Wire Works. A new 2-story plant 60 x 200 feet is being built on Wiser avenue for the new concern. This will be equipped with modern wire making machinery. Operations are expected to start by February.

* * *

ST. LOUIS TRUNK HARDWARE MFG. CO., St. Louis, has sold its assets and goodwill to the Atlas Tack Corp., which will continue its operation, producing the same line of goods.

* * *

VAUGHN MACHINERY CO., Cuyahoga Falls, O., has taken an order from Bethlehem Steel Co. for 85 variable speed wire-drawing blocks and from the Riverside Metal Co., Riverside, N. J., for several of these units.

* * *

UNIFLOW PUMP & MFG. CO., Dayton, O., has bought the plant of the Lakeside Forge Co., East Lake road, Erie, Pa., and will move its equipment into the plant at once. Michael A. Martin, Erie, Pa., is general sales manager, with offices at 1608 State street.

* * *

BATAVIA STEEL PLATE CONSTRUCTION CO., Batavia, N. Y., has increased its capital from 200 to 600 shares no par value. Directors of the company are Herman Hatten, Robert McBride, Oscar A. Epp, Edward A. Washburn and Edna B. Westacott.

* * *

SUFFOLK IRON & STEEL CO. INC. has been organized at Chelsea, Mass., to deal in nonferrous and iron and steel scrap. Chelsea is a suburb of Boston and the heart of the nonferrous scrap industry of eastern Massachusetts. The new company will start with a capital of $5000. Milton Baum of Holyoke, Mass., is president, and Isaac M. Gerber of Chelsea is treasurer.

* * *

IN CONTEMPLATION of further enlargement of its plant, the Wilboken Mfg. Co., Milwaukee, manufacturing electric controlling devices, has purchased the property, 50 x 125 feet, adjoining its shop at 404-406 Grove street. It has not been definitely decided when work on the proposed addition is to start. The present shop is 63 x 100 feet, 3-story. George A. Knaak is president and manager.

* * *

PITTSBURGH DIE CASTING CORP., Pittsburgh, has been formed to take over the business of the Pittsburgh Die Casting Co., with general offices and plant at Swissvale, Pa. Improvements to buildings and equipment will be made to increase facilities for die casting service. The following are officers of the new corporation: President and manager, H. F. Messersmith; vice president, H. M. Meixner; secretary, Howard G. De Van; and treasurer, F. M. Townsend.

* * *

SESAMEE LOCK CO., a newly organized concern at Hartford, Conn., is getting under production. Officers of the company say that more than 1000 locks a day will be the regular rate of output after the first of the year. The product is a new type of lock invented by Major Mead Wildrick of the United States coast artillery. It has already been adopted as standard equipment for hand luggage made by John Boyle & Co. and Warren Co. It is also standard equipment for the Whery Co., Racine, Wis., the Winship Trunk Co., Utica, N. Y., and the Rand Office Equipment Co., Tonawanda, N. Y.

* * *

WALL-JOHNSON SUPPLY CO., 1012-14 Santa Fe building, San Francisco, has been organized by Charles A. Wall and Walter G. Johnson and will warehouse merchant bars, structural shapes, plates, sheets and cold rolled shafting. In addition they will handle waste, sanitary wiping rags and ferrous and nonferrous scrap metal. Messrs. Wall and Johnson have been connected with the Steel Mill Foundry & Supply Co. for the past six years. Prior to this Mr. Wall was connected with Baker, Hamilton & Pacific Co. and the Judson Mfg. Co., while Mr. Wall was associated with Harron, Rickard & McCone Co., the Southern Pacific purchasing department, San Francisco and the Pacific Electric Co., and Pacific Oil Co., in Los Angeles.

Panhandle Field Gets Big Power Plant

A large industrial district is being created as a result of oil and gas developments in the Panhandle of Texas. That permanency of production is believed assured is evidenced by construction of an electric power plant at Electric City, in the heart of the oil field four miles northwest of Borger, Tex., by the Panhandle Power & Light Co., subsidiary of the Kansas Power Securities Co. The first unit was placed in operation Nov. 17. It will represent an expenditure of approximately $2,000,000, and to it will be immediately added other units which will bring total capacity up to 70,000 horsepower, and the total cost of construction to $7,500,000. Initial installation consists of two turbo-generator units, with a combined capacity of 14,000 horsepower or 10,000 kilowatts, with the necessary boilers, auxiliaries and electrical apparatus. Power will be generated at 13,200 volts. J. F. Porter, Kansas City, Mo., is president of the Panhandle Power & Light Co.

Urges Tariff Appeal

L. C. Andrews, assistant secretary of the treasury, has sent a communication to the assistant attorney general at New York asking him to file a request with the United States court of customs appeals for a review of a recent decision of the court in which it was held that steel sheet piling and steel corner piles classified under paragraph 304 of the tariff act of 1922 were dutiable under the provisions of paragraph 312 of the act as structural shapes.

Acme Machine Products Co., Kalamazoo, Mich., has increased capital from $120,000 to $260,000.

Obituaries

ELTON B. HULL, in charge of blast furnace and coke operations of Pickands, Mather & Co., Cleveland, died at his home in Cleveland Heights, Nov. 22. He was born Jan. 10, 1872 near Sharon, Pa. He became a chemist and later furnace superintendent in the valley. Then he went to the Maryland Steel Co., Sparrows Point, Md., and next to the Ashland Iron & Mining Co., Ashland, Ky., as blast furnace superintendent. He was appointed superintendent of Pickands, Mather & Co.'s valley furnace operations, which included the Alice and Ella stacks, about 1903, and in 1907 went to Toledo as general superintendent of the Toledo Furnace Co., a subsidiary of Pickands, Mather & Co. In January, 1921 he came to the Cleveland headquarters, in charge of the company's blast furnace and coke oven operations. Mr. Hull was a member of the American Iron and Steel institute. He was a thirty-second degree Mason, a member of the Union, Shaker Heights and Mid-day clubs, Cleveland; Toledo Country club, Duquesne club and Erie club.

* * *

John J. Bushnell, a manufacturer of steel specialties, died Nov. 16 at his home in Brooklyn, N. Y., aged 73.

* * *

Thomas H. Mirkil Jr., Philadelphia district sales manager for the Treadwell Engineering Co., Easton, Pa., builder of rolling and other machinery and maker of castings, died Nov. 12.

* * *

H. J. Rowland, director and vice president of the Copper and Brass Research association, and director and sales manager of the Rome Brass & Copper Co., Rome, N. Y., died recently in New York.

* * *

John W. Walton, aged 81, founder and president of the Upson-Walton Co., Cleveland, ship chandler, died Nov. 19 of acute pneumonia. Mr. Walton was a veteran of the Civil War, and for many years has been identified with Cleveland charity organizations.

* * *

Charles W. Many, treasurer of the Remington Arms Co., 25 Broadway, New York, died Nov. 18 at a hospital in Brooklyn, N. Y., after an illness of two months. He was 56 years old. Mr. Many's connection with the Remington Arms Co. and its predecessors, the Union Metallic Cartridge Co. and M. Hartley & Co., had been continuous for 40 years.

* * *

Douglas T. Thompson, of Farmington, Conn., president of the Ferry Steam Turbine Co., Hartford, Conn., was killed Nov. 21 at Warehouse Point, Conn. Mr. Thompson was killed in an automobile accident when he lost control of the car he was driving. Edward W. Cummins, industrialist of Winnetka, Wis., accompanying Mr. Thompson, also was killed.

* * *

James Furman Kemp, aged 67, professor of geology at Columbia university, New York, died suddenly at his home in Great Neck, Long Island, Nov. 17. Professor Kemp was one of the foremost geologists in the United States, and was an authority on mining and metallurgical problems. He was a past president of the American Institute of Mining and Metallurgical Engineers.

* * *

James Guthrie Caldwell, former president of the Birmingham Rolling Mill Co., with works at Birmingham, Ala., died Nov. 16 at his home in Louisville, Ky., aged 71 years. In 1880 he built a puddling mill at Birmingham. The mill was sold later to the Republic Iron & Steel Co. but since has been dismantled.

* * *

Wallace M. Pattison, president of the W. M. Pattison Supply Co., Cleveland, iron and steel jobber, died Nov. 16 at the age of 68, from the effects of a paralytic stroke four months ago. Mr. Pattison formed his first connection with the steel distribution business in the seventies, as office boy for George Worthington Co., Cleveland. He advanced from office boy to president in 18 years and shortly afterward retired to form W. M. Pattison Supply Co. Mr. Pattison had been president of the National Supply and Machinery Dealers' association for two successive terms. He was a member of the City and Union clubs, a director of the chamber of commerce, Guardian Trust Co., Swartout Co., and several savings and loan companies in Cleveland. He was active in civic affairs, being president of the East Cleveland city commission.

* * *

G. A. Sacchi, manager of the stoker sales department, Westinghouse Electric & Mfg. Co., died suddenly Nov. 4, at his residence in Lansdowne, Pa. Mr. Sacchi began his career for Westinghouse, Church, Kerr & Co. in 1893 which then represented the selling organization of the Westinghouse Machine Co.

In 1909 Mr. Sacchi became actively engaged in the sale of stokers in the New York territory of the Westinghouse Machine Co. and later in the sale of large turbines. He was appointed district manager of stoker sales in the New York office in 1918 and subsequently manager of stoker sales for the entire company with headquarters at East Pittsburgh, Pa. In April, 1926, Mr. Sacchi was elected president of the Stoker Manufacturers' associationwhich honor he held at the time of his death.

* * *

Charles S. Cook, vice president and treasurer of the Kaestner & Hecht Elevator Co., died in Pittsburgh, Nov. 15. Mr. Cook who formerly was associated with the Westinghouse Electric & Mfg. Co. and the Duquesne Light Co. was widely known in electrical manufacturing and business circles. He had been identified with the electrical industry since 1887. Mr. Cook was a native of Amherst, Mass., and a graduate of Worcester Polytechnic institute. He entered the employ of the Westinghousee company in 1887. In 1892 he laid out and sold the first long distance transmission system installed in the United States. In 1895 he was transferred to Pittsburgh to take up the application of electrical apparatus to steel mills. He was made manager of the Westinghouse Pittsburgh office in 1899 and five years later, 1904, became manager of the Westinghouse railway and lighting department at East Pittsburgh, Pa. The position he held until 1917 when he resigned to become general manager of the Duquesne Light Later he was made a vice president of the company. In 1924, he affiliated himself with the aKestner & Hecht Co. Later he was made a vice president of the company. In 1924, he affiliated himself with the Kaestner & Hecht Co. as vice president and treasurer with headquarters in Chicago.

Machinery

Business Is in Close of Year Slump—Little Improvement Expected Before First of Year —Railroads and Auto Industry Inactive

APPARENTLY machine tool and equipment activity is suffering from the customary close of the year slump, for reports from practically all important manufacturing and selling centers indicate a dearth of business. There are no definite signs that buying will show improvement until after the first of the year. Only in the New England area does activity look encouraging. Here the New York, New Haven & Hartford is tentatively in the market for tools for its New Haven shops and the Boston & Maine is inquiring for equipment for a $500,000 shop addition. Railroads generally are inactive and automobile manufacturers are purchasing only as replacements demand. General industrial sales are for one or two tools at a time.

New York, Nov. 23.—While inquiry in machine tools is showing some improvement, actual buying is far from brisk. Scattered orders include a 12-foot plate flanging clamp; 42-inch rotary miller for a concern in Schenectady, N. Y., and a bolt cutter for a shipyard in Brooklyn, all going to the Niles-Bement-Pond Co., New York. Ontario & Western is starting construction of car repair shops at Middletown, N. Y., but has not yet come in the market for machine tools. A substantial amount of fabricating equipment likely will be required for a new tank shop for the Baldwin Locomotive Works, Eddystone, Pa. An interesting order calls for ten bench lathes for Waltham Watch Co., Waltham, Mass., placed with the Pratt & Whitney Co. This builder also has received contracts for a die sinker for a company at Cortlandt, N. Y.; two automatic millers for a magneto company at Sidney, N. Y., and two 16-inch lathes, one for Baltimore and the other for a hardware concern in Chicago. This company has also closed on a profiler for Detroit, a jig borer for Milwaukee, and a bench lathe for a typewriter company in Hartford, Conn.

Boston, Nov. 23.—Machine tool sales have improved during the week and prospects now look the best for several weeks. A Springfield, Mass., manufacturer bought two heavy upright drills and three other drills besides a screw machine and other tools. A small tool manufacturer bought a 4-foot radial drill. General Electric Co. bought several light tools for its Pittsfield, Mass., plant. New York, New Haven & Hartford railroad is tentatively in the market for tools for its New Haven shops. Boston & Maine railroad is preparing equipment lists for a new $500,000 shop addition at Billerica, Mass. United Shoe Machinery Co. at Boston bought a special grinder and is in the market for several milling machines. Tool manufacturers in the district are operating at about 70 per cent of capacity, according to recent employment bureau reports.

Pittsburgh, Nov. 23.—Equipment sellers universally report a quiet week in this vicinity. A few individual sales of machines, such as a centerless grinder to the Westinghouse Electric & Mfg. Co., are noted. This latter interest also bought some marking machines and other small items, but shortly will commence to buy in earnest against its large list. One large supply house reports a splendid movement of portable electric tools, small pipe machines, grinders, etc. Inquiries are less numerous than they were in October although a number of propositions still are held in abeyance against which some action will be taken soon.

Cincinnati, Nov. 22.—Activity in the machine tool and equipment market in this district has tapered off considerably since Nov. 1 and all indications are that November's volume of business will be considerably under that of October. Orders forthcoming for the most part have been of a single tool nature and the same is virtually true of inquiries. However, John Van Range Co., Cincinnati, is in the market for a list of tools for outfitting its new plant which is being erected in Oakley. Railroad buying has been on an exceedingly small scale in recent weeks. Automobile manufacturers are buying sparingly and the same is true of the other industrials. Plant operations of tool builders have fallen off. A few plants are operating better than 60 per cent of capacity. Manufacturers are not anticipating any material improvement in conditions until after the first of the year.

Chicago, Nov. 23.—The brisk activity which featured the Chicago machine tool market at the opening of November has failed to continue past the middle of the month. The pick-up from the previous month was short-lived and both sales and inquiry now show a decline. Action on the Illinois Steel Co. list is being deferred with monotonous regularity. It is reported that Illinois Central railroad has placed several tools, but has ordered delivery withheld for further instructions, cause unknown. Other railroads appear to be out of the market. The best that any dealer appears able to say is that business is holding up equal to October, and such statements are isolated.

Cleveland, Nov. 23.—Sales in this territory are holding up fairly well, although all are small. Inquiries are coming in steadily but only a small portion develop business as there is an apathy on the part of purchasers to order against requirements until after the start of the new year. Much of the business which is being placed on the books is for replacement. Manufacturers are active and in some cases operating overtime to make deliveries. Shipments are being made to all parts of the country and to all industries, with the exception of automobile manufacturing which has practically shut off all buying.

CRANE ORDERS PLACED

Two 5-ton cranes for General Electric Co., Schenectady, N. Y.; to Whiting Corp.

Among single orders were: 7½-ton crane for Detroit Gray Iron Foundry Co., to Whiting Corp.; 25-ton traveling gantry crane for Long Island railroad, to Niles Crane Corp.; 5-ton handpower crane for a dealer in Newark, N. J., to New Jersey Foundry & Machine Co.; 17½-ton used crane for E. W. Bliss Co., Brooklyn, N. Y., to Industrial Works; crawler crane for D. C. Serber, New York, to Byers Machine Co.; used locomotive crane for Eau Claire Sand & Gravel Co., Eau Claire, Wis., to American Hoist & Derrick Co.; 25-ton locomotive crane for New York Central railroad for operation at Cleveland, to Browning Crane Co., the New York Central has withdrawn its inquiry for a second locomotive crane for New York; electric overhead crane for Chattanooga, Tenn., plant of United States Cast Iron Pipe & Foundry Co., to to Niles Crane Corp.

CRANE ORDERS PENDING

Several electric traveling cranes for power house installation for the department of city transit, Philadelphia; bids closed.

One trolley for the American Steel & Wire Co., Donora, Pa., bids being taken at Cleveland; bids for additional crane equipment for Worcester, Mass., are being taken in the East.

20-ton crane for Wheeling Steel Corp., Benwood, W. Va.; bids being taken.

25-ton gantry crane for Erie railroad for installation at Rochester, N. Y.; pending.

Milton Mfg. Down as Receiver Pends

New York, Nov. 23.—Due to a lack of capital, blamed to construction of a new bar mill, the Milton Mfg. Co., Milton, Pa., has suspended operations pending the appointment of a receiver in equity. The action, it is said, is friendly and operations are expected to be resumed shortly. A new financing plan is now being considered. The company manufactures iron and steel commercial bars, concrete reinforcing bars, bolts and a full line of hot pressed and cold punched nuts. It also specializes in alloy steel. The plant employes approximately 800 men. Officials state that the value of the company's property is more than $4,000,000 quick assets are approximately $1,000,000 and liabilities are materially less than the quick assets.

Eisenman Entertained by French Metallurgists

W. H. Eisenman, secretary of the American Society for Steel Treating has just returned from a seven-weeks tour of important industrial cities of England, France and Germany. At the larger centers, such as London, Sheffield, Paris and Essen, he was entertained by metallurgists and officials of the iron and steel industry.

On the occasion of Mr. Eisenman's visit to Paris, he was the guest of several prominent French metallurgists at a dinner at the Hotel California on Nov. 4. Opinions were exchanged relative to recent developments in heat treating processes, alloys and stainless steels. An interesting talk was made by M. Aubert, Aubert & Duval Freres, who specialize in alloy steels for automobiles and airplanes. M. Aubert had just returned from United States where he went to introduce his new process of hardening steel by nitrogen at low temperatures and without deformation. While he was in America he presented his paper before several local sections of the American Society for Steel Treating and aroused interest in the possibilities of the new process.

Among others presented at the dinner were: Doctor Galibourg, maitre de conference at Ecole Centrale de Paris and chief metallurgist, De Disn Automobile Co. and principal assistant of Professor Guillet, membre de l'Institute and director of the Ecole Centrale; M. Suhr, chief engineer and director of research work of Cie des Produits Chimiques et Electrometallurgiques Alais, Froges et Camargue; M. Gabriel Barriere, Agrege de l'Universite and chief engineer of Chenard et Walcker, automobile manufacturers; M. Bres, an expert in stainless steels; M. Gillet, French representative of Wyman-Gordon Co. and L. W. Moore, representing the Crane Co. of Chicago.

M. Suhr has made a special study of the application of light alloys with high tensile strength and conductivity to the manufacture of power cables and telegraph lines. The alloy, which is of aluminum, magnesium and silicon is said to possess much the same characteristics as copper. M. Barriere has done much work in steel treating, measuring of high temperatures and is the author of an important paper dealing with the purification of blast furnace gases.

Industrial Business Changes

LINK-BELT CO., Chicago, manufacturer of chain for industrial uses, has opened a sales and service branch at 152 Temple street, New Haven, Conn., in charge of R. H. Hagner, formerly in the company's Philadelphia office.

* * *

Sound Machine Shop Inc., Mamaroneck, N. Y., has changed its name to Sound Marine and Machine Shop Inc.

* * *

Kirby-McCool-Cyphers, 178 Commerce street, Newark, N. J., dealer in machinery, has changed its name to Kirby-McCool.

* * *

Acme Steel & Malleable Iron Works, 245 Military road, Buffalo, has changed its name to the Buffalo Brake Beam Co.

* * *

Jacob Pearl Inc., dealer in metals, has moved its offices to 6970 West Jefferson avenue, Detroit.

* * *

Standard Turbine Co., Scio, N. Y., has opened an office at 1605 Chemical building, St. Louis, in charge of F. E. Bausch.

* * *

Charles H. Lea, treasurer of the Fenton Machine Tool & Die Co., Fenton, Mich., has sold his interest in the firm to O. L. Bard and Otto Lundell, Detroit, the latter president and general manager.

* * *

Lufkin Foundry Machine Co., Lufkin, Tex., has opened a sales office at Tulsa, Okla., in charge of W. W. Trout.

* * *

Case Crane & Engineering Co., Columbus, O., has changed its name to Case Crane & Kilbourne Jacobs Co.

* * *

Torino Wrought Iron Mfg. Co., New York, has leased space for shop and offices at 215 East Twenty-third street, and will move there shortly.

* * *

B. Nicoll & Co., New York, has taken out a permit in Texas to do general importing of iron and steel and metal products, with headquarters at Galveston.

* * *

Simplex Wire & Cable Co., has moved its office at St. Augustine, Fla., to the Barnett National Bank building, in charge of Miss F. H. Pettee.

* * *

Tulsa Fence & Post Co., Tulsa, Olka., has been appointed distributor for Oklahoma for the Page Steel & Wire Co., Bridgeport, Conn. F. M. Ailes is manager of sales.

* * *

United States Lock & Hardware Co., Columbia, Pa., has been bought by P. R. Baker, Coatesville, Pa., and associates, and the manufacture of specialties will be continued.

* * *

Charles W. Hunt, formerly of F. R. Phillips & Sons Co., has organized the Charles W. Hunt Co. with headquarters at Seventeenth and Market streets, Philadelphia.

* * *

D. D. Wessels & Sons, manufacturer of plumbing fixtures, has established a branch factory at 840 Tchoupitoulas street, New Orleans, in charge of Felix F. Tranchina.

* * *

Botfield Refractories Co., Philadelphia, has appointed several additional distributors: Curtis Supply Co. Inc., Washington and Perry streets, Buffalo; Waldredh Supply Co., 707 Cherry street, Des Moines, Iowa; Empire Machinery & Supply Corp., 409 Water street, Norfolk, Va.

* * *

R. L. Batteiger and A. R. Robinson, formerly of the scrap department of Hickman, Williams & Co. in the Philadelphia territory, have organized to do a business in iron and steel and other scrap. They will trade under the name of R. L. Batteiger and will have headquarters at 1644 Widener building, Philadelphia.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

PHOENIX, ARIZ.—Arizona Iron Works is having plans drawn for a 1-story machine shop.

BERKELEY, CALIF.—B. F. Sturtevant Co., manufacturer of fans and blowers, will build a plant at Camelia and Ninth street.

OAKLAND, CALIF.—DeSannox Foundry & Machine Co., 2941 East Twelfth street, has bought a site on East Fourteenth street and is considering plans for a foundry and machine shop.

SACRAMENTO, CALIF.—County supervisors are planning a warehouse and machine shop for care of public machinery and equipment.

NEW HAVEN, CONN.—A. C. Gilbert Co., mechanical toys and electric fans, has let contract to Pratt & Madison for an addition 30 x 95 feet with dies vault 30 x 41 feet.

MACON, GA.—Taylor Iron Works & Supply Co., 1014 Broadway, has had plans made for a steel fabricating plant.

CHICAGO—Sloan Valve Co. 4300 West Lake street, plumbers supplies, is building a 3-story addition 100 x 135 feet to its plant at 4340 West Lake street.

CHICAGO—J. J. Harrington & Co., 38 South Dearborn street, is preparing to build a 1-story repair shop 134 x 233 feet at Lake street and Harding avenue, one story, 123 x 233 feet.

CHICAGO—Ketler & Elliott, C. S. Mills, manager, 3121 South California avenue, is taking bids on a 1-story machine shop and office building 60 x 60 feet and 2-story 20 x 40 feet.

CHICAGO—Ideal Specialty Corp., 947 Roscoe street, has been incorporated with $25,000 capital to manufacture sheet metal and aluminum products by J. D. Henderson, Harry Levy, C. M. Stucker. Irving L. Block, 160 North LaSalle street, is correspondent.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

CHICAGO—Lovejoy Chicago Co., 2613 South Michigan avenue, has been incorporated with $10,000 capital to manufacture shock absorbers and other automobile accessories by Morris I. Weil, Milton J. Sabath and Charles A. Churan, 29 South LaSalle street.

CHICAGO—American Tool Salvage Corp., 723 Fulton street, has been incorporated with $20,000 capital to manufacture grinding, polishing and sharpening devices by Ralph J. Cogswell, Harry J. Cogswell and Erik Anderson. Abraham Redman, 105 West Monroe street is attorney.

CHICAGO—Titan Forge & Tool Works, Inc., 2224 West Grand avenue, has been incorporated with 300 shares no par value to manufacture metal products by Harold G. Rice, Charles S. Goodale and Arthur L. Richtmyre. Gustav E. Beerly, Chamber of Commerce building, is correspondent.

EAST PEORIA, ILL.—Caterpillar Tractor Co., West Washington street, will build a service, repair and garage building.

ELGIN, ILL.—Hallet Burner Co., 63 North street, has been incorporated with $25,000 capital to manufacture oil burners, heaters and other devices by William F. Hallet, E. D. Hammond, and J. M. Stewart. Arthur L. Paulson, Elgin, is attorney.

LA SALLE, ILL.—Western Clock Co., Fourth street, is considering plans for a 2-story addition to be built in the spring. H. E. Hackman is secretary.

MOLINE, ILL.—Standard Calorimeter Co. has had plans drawn by W. H. Schulze, Peoples Bank building, for a 1-story foundry 60 x 120 feet.

WAUKEGAN, ILL.—J. S. Heath Co., Market street, brass and bronze specialties, will build a 1-story plant, 100 x 250 feet. R. O. Allexan is general manager.

CONNERSVILLE, IND. — McQuay-Norris Co., St. Louis, manufacturer of piston rings, will build a 1-story branch here, 50 x 95 feet.

FORT WAYNE, IND.—Edmunds Electric Co., manufacturer of electrical equipment, will build a 2-story plant, 40 x 120 feet.

FT. WAYNE, IND.—Edmunds Electric Co. is building a 2-story plant 40 x 121 feet at 1500 Calhoun street.

INDIANAPOLIS—Peerless Foundry Co., 1853 Ludlow avenue, is building a 1-story foundry 67 x 182 feet.

INDIANAPOLIS—Schwitzer & Cummins, 1125 Massachusetts avenue, manufacturer of automobile parts, is building a 1-story factory 200 x 300 feet.

INDIANAPOLIS — Vawter-Ulrich Mfg. Co. has been incorporated with $10,000 capital to manufacture electrical and mechanical devices by John M. Vawter, T. D. Ulrich and Charles A. Vawter.

PLYMOUTH, IND.—Plymouth Metal Work-

Where Machinery Exports Went in September

	Lathes: Engine	Lathes: Turret	Lathes: Other	Drills: Vertical	Drills: Radial	Drills: Sensitive	Other	Gear cutters	Pneumatic portable tools	Planers	Shapers and slotters	Metal sawing cutting	Milling knee column	Mach. other
Austria	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	.....
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....
France	.....	2	.....	.....	.....	.....	.....	26	44	.....	1	5	2	2
Germany	1	.....	1	.....	.....	.....	.....	2	6	.....	.....	.....	.....	2
Italy	.....	.....	1	2	.....	.....	2	.....	43	.....	.....	.....	.....	.....
Netherlands	.....	.....	2	.....	.....	1	.....	.....	14	.....	.....	.....	.....	.....
Spain	.....	.....	.....	.....	.....	.....	.....	1	47	.....	.....	.....	.....	.....
Sweden	.....	.....	3	.....	.....	.....	.....	.....	4	.....	.....	.....	6	2
United Kingdom..	.....	2	3	1	.....	6	10	3	207	.....	13	.....	2	2
Canada	.....	2	13	3	3	6	37	.....	106	3	.....	1	.....	1
Mexico	.....	1	2	.....	.....	11	1	8	83	.....	1	1	.....	.....
Cuba	1	.....	2	.....	.....	.....	.....	.....	12	.....	.....	.....	.....	.....
Argentina	1	.....	.....	.....	.....	.....	.....	.....	194	.....	.....	.....	.....	.....
Colombia	.....	.....	.....	.....	.....	.....	.....	.....	16	.....	.....	.....	.....	.....
Chile	3	.....	.....	.....	.....	.....	1	.....	38	.....	.....	1	.....	.....
Brazil	1	.....	.....	.....	.....	6	1	.....	16	.....	.....	.....	.....	.....
British India	.....	.....	.....	.....	.....	12	19	.....	49	.....	.....	.....	.....	.....
China	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Japan	.....	.....	.....	20	.....	.....	2	.....	85	.....	118	1	2	3
Philippine Islands	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
Australia	2	.....	.....	.....	.....	.....	24	.....	270	.....	1	1	.....	1
New Zealand	.....	.....	.....	.....	.....	.....	.....	.....	13	.....	3	1	.....	.....
British S. Africa	.....	.....	.....	.....	1	.....	12	.....	81	.....	.....	.....	.....	.....
Other countries....	2	2	13	6	1	1	27	.....	25	.....	7	2	1	.....
Tots., September	18	9	48	32	6	43	128	40	1,351	3	149	13	17	13
August	20	23	37	16	3	80	91	18	1,056	.....	55	21	12	22
July	12	11	71	17	2	28	62	19	1,269	2	16	23	35	25
June	14	10	59	24	1	105	85	6	.....	3	20	19	30	18
May	14	17	41	44	8	281	81	12	.....	.....	23	22	11	22
April	25	11	41	28	7	34	314	16	.....	111	33	19	104	75
March	6	9	75	46	5	122	92	22	.....	.....	34	16	14	43

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.50
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, f.o.b. cars Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	10.00 to 11.00
North African low phosphorus	9.25 to 9.75
Swedish and Norwegian low phosphorus, 68 per cent	10.25 to 10.75
Swedish foundry or basic, 66 to 68 per cent	9.00 to 9.50
Spanish foundry or basic, 50 to 54 per cent	8.75 to 9.25
North African foundry and basic 50 to 54 per cent	8.50 to 9.50

(All foreign ore prices now nominal)

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum, 47 per cent.....nominal
Indian, minimum 47 per cent....36 to 38 cents
Caucasian, 53 to 55 per cent
Washed .....40 cents

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton..	$18.00
Washed gravel, imported duty paid eastern tidewater, per ton	16.75 to 17.50

ing Co. will build a 1-story plant 50 x 150 feet.

SOUTH BEND, IND.—Woodward Pattern Works, 321 North Michigan avenue, will build a 1-story plant 40 x 100 feet. M. E. Smith, 323 South Main street, is architect.

NEW ORLEANS—D. D. Wessels & Son Co., 1635 East Euclid street, Detroit, has leased property at 840 Tchoupitoulas street and will establish branch plant to manufacture electric water heaters. Felix F. Tranchina is representative.

SHREVEPORT, LA.—Contract for erection of Gilmer Cotton Mill, reinforced concrete, steel and brick construction, 150x400 feet, awarded La Grange Lumber & Supply Co.

BALTIMORE—Bartlett Hayward Co., 200 Scott street, will build a 1-story forge shop, 44 x 70 feet, to replace one recently burned.

BALTIMORE, MD.—Cross & Blackwell Ltd., 146 West Twenty-second street, New York, has bought a site of five acres at Canton, a suburb, and will build a power house and machine shop as first units of a large plant.

BILLERICA, MASS.—The Boston & Maine railroad will build a $500,000 boiler shop as an addition to its locomotive repair plant here. The new building will be 572 feet long, 150 feet wide and 50 feet high over the middle aisle.

BOSTON—American Steam Gage & Valve Co., 80 Federal street, will build a 3-story addition to its plant on Camden street.

BOSTON—L. Erikson Electric Co., 7 Portland street, Everett, Mass., manufacturer of electrical appliances, will build a 2-story plant 50 x 160 feet on Revere Beach boulevard.

BOSTON—Emerson & Mason Inc. has been incorporated with 200 shares no par value to manufacture oil heaters, refrigerators and other devices by Scott Emerson president, Trafton Mason treasurer, Northampton, Mass., and Albert M. Chandler.

BOSTON—Diamond Vaporizer Sales Inc. has been incorporated with 100 shares no par value to manufacture mechanical devices by Clarence T. Wilson, 259 Blue Hillsparkway, Milton, Mass.; Malcolm C. Wilson treasurer, Melrose Highlands, Mass., and I. Worshofsky.

BOSTON—Hexders Co. has been incorporated with 150 shares no par value to manufacture automobile parts and appliances by David B. Newell president, James C. Turpin vice president and Charles A. Hinke treasurer, Osterville, Mass.

BOSTON—Nut Distributors Inc. has been incorporated with $50,000 capital to manufacture nut-manufacturing machines by Lucas Spellman, 206 Bigelow street, Boston, Henry Copeland, treasurer, North Reading, Mass., and James S. Dunn.

CAMBRIDGE, MASS. — Hinman Asbestos Corp. has been incorporated with $25,000 capital to manufacture asbestos materials, mill, plumbing and heating supplies by Frank C. Hinman, president, 198 Russell street, Worcester, Mass.; George W. Hinman, treasurer, Worcester, Mass.; and Curtis H. Waterman.

CHELSEA, MASS.—Bay State Armature Service Inc. has been incorporated to manufacture automobile armatures and other accessories with $2000 capital by Israel G. Rubin, president and treasurer, 10 Warren avenue, Chelsea, Mass.; C. A. M. Rubin and Louis D. Margolis.

EVERETT, MASS.—Market Forge Co., Garvey street, will build a 2-story forge shop, 67 x 90 feet.

LYNN, MASS.—Eastern Tool Stamping Co., Ballard street, Saugus, Mass., will build a 1-story addition to its plant.

LYNN, MASS.—Lynn Foundry Co., 993 Broad street, will build a 1-story foundry to replace one recently burned.

LYNN, MASS.—Industrial Mfg. Co. has been incorporated with $95,000 capital to manufacture automobile locks and other devices and automobile accessories by Herbert S. Cotton president, 240 Sumner street, Boston; Augustus M. Nickerson, 14 Harbor View street, Winthrop, Mass., and Clayton S. Nickerson.

SPRINGFIELD, MASS.—Perkins Machine & Gear Co. has been incorporated with $500,000 capital and 15,000 shares no par value to manufacture machinery, parts and tools by Julian L. Perkins president, 86 Riverdale street, West Springfield, Mass., and James A. Perkins treasurer and clerk, 363 Tremont street, Springfield and John A. Oakley.

WOBURN, MASS.—The Woburn Co-operative bank will build a 1-story and mezzanine 50 by 60-foot brick, limestone and cast stone bank.

WORCESTER, MASS.—Johnson Steel & Wire Co., G. S. Johnson manager, 22 Lake avenue, is building a 2-story plant 60 x 100 feet.

WORCESTER, MASS.—Boston & Albany railroad will build a $300,000 round house on Grafton street. The general contract has been let to F. F. Fitzgerald Construction Co., Boston.

CHARLOTTE, MICH.—Hancock Mfg. Co., H. W. Hancock president, manufacturer of automobile hardware, has bought the former plant of the Earl Motors Co., Jackson, Mich., and will utilize a portion for production of its devices.

DETROIT—Detroit Auto Jack Co. has been incorporated with 1500 shares no par value to manufacture lifting devices by Frederic W. Cook, 2087 West Grand boulevard, Daniel C. McDowell and William C. Metzger, Detroit.

KALAMAZOO, MICH.—Voigtmann Metal Window Corp. has been incorporated with $60,000 capital to manufacture metal windows and accessories by Robert C. Voightmann, 412 Douglas avenue, Kalamazoo. Orla N. Iman, Chicago, and John R. Casselman, Kalamazoo.

MARINE CITY, MICH.—Marine City Motor Castings Co. will build two additional structures at its plant, increasing floor space 6000 square feet.

MUSKEGON, MICH.—Panyard Machine & Mfg. Co., 296 Western avenue, manufacturer of piston rings, will build a new plant one story, 120 x 165 feet, and 2-story, 35 x 130 feet.

MUSKEGON, MICH.—March Automatic Irrigator Co., Tracy Cone manager, 945 West Western avenue, has let contract to George Luther & Sons, Traverse City, Mich., for a 1-story plant 60 x 200 feet at Ottawa street and Pere Marquette railroad.

MINNEAPOLIS, MINN.—Minneapolis Heat Regulator Co., 2747 Fourth avenue, will build a 5-story plant, 60 x 165 feet.

MINNEAPOLIS, MINN.—Electric Machinery Mfg. Co., 1331 Taylor street, will build a 2-story addition, 40 x 110 feet and 26 x 50 feet.

KANSAS CITY, MO.—Sheffield Steel Mills has erected addition 50x150 feet for housing open hearth furnace equipment.

ST. LOUIS—International Heating Co. has been incorporated by Jacob Ellman, 719 Harvard street, to manufacture heating devices.

ST. LOUIS—Mound City Electric Fixture & Mfg. Co. has been incorporated with $40,000 capital by Edward Cooke, 3755 West Florissant street.

ST. LOUIS—St. Louis Motor Valve Co., Inc., 4527 Olive street, has been organized to manufacture valve-operating mechanisms and electrical control specialties and will need some equipment and parts supplies.

GARWOOD, N. J.—The Thatcher Furnace Co., South avenue, has awarded structural steel for a plant addition.

METUCHEN, N. J.—Edward M. Lawler

has been incorporated with 1000 shares no par value to manufacture pulverizing machinery and ball mills.

NEWARK, N. J.—Auto Strop Safety Razor Co., 656 First avenue, New York, has bought site 60 x 285 feet adjoining its plant here for expansion.

NEWARK, N. J.—Orange Mower & Tool Works has been incorporated with $50,000 capital by John Turton, and W. Eugene Turton, Irvington, N. J. and William H. Biedelman, Maplewood, N. J. W. Eugene Turton, Newark, N. J., is attorney.

NEWARK, N. J.—Purdy & McLeod Inc. has been incorporated with $20,000 capital to manufacture ornamental iron by James Purdy and Mamie Purdy, Singac, N. J.; Robert McLeod, and Arabella McLeod, Irvington, N. J. Eernard T. Stafford, Paterson, N. J., is attorney.

NEWARK, N. J.—Thatcher Furnace Co., 39 St. Francis street, manufacturer of furnaces and boilers for heating, has let contract to Wigton-Abbott Corp., 552 West Twenty-third street, New York, for extensions and improvements to a plant recently bought at Garwood, N. J., 100 x 200 feet.

NORTH BERGEN, N. J.—Automatic Coal Burner Corp. has been incorporated with $20,000 capital and 200 shares no par value by Emil J. Decker, Woodcliff, N. J.; William Decker, Cliffside, N. J. and Gustave Seufer, Weehawken, N. J. Edwin C. Eastwood, Union City, N. J., is attorney.

TRENTON, N. J.—Congoleum-Nairn Inc. have awarded reinforcing bars and structural steel for a factory building to be erected here.

BROOKLYN, N. Y.—C. E. Halback & Co., 189 Banker street, ornamental iron, has let contract to R. H. Howes Construction Co., 103 Park avenue, for a 2-story addition to its plant.

BROOKLYN, N. Y.—Public Industrials Corp., Edward R. Welles president, and its subsidiary, National Dry Cleaning Corp., have engaged J. G. White Engineering Corp. to extend plant at Morgan avenue and Beadel street by addition 50 x 100 feet and installation of equipment. Entire plant is to be fireproofed.

BUFFALO—Acme Steel & Malleable Iron Works, 245 Military road, electric steel and malleable castings, will build a 1-story addition, 60 x 220 feet.

BUFFALO—Buffalo Automatic Heat Corp. has been incorporated with $10,000 capital to manufacture heating devices by H. R. Bernhardt and S. H. Millener. Love & Keating, Buffalo, are attorneys.

NEW YORK CITY—New York Central has closed on structural steel to Levering & Garrigues for a freight warehouse here.

NEW YORK—Interboro Sheet Metal Works has been incorporated with $5000 capital by M. M. Schick, S. Schick and D. W. Israel. H. H. Spitz, 55 Liberty street, is attorney

NEW YORK—Edwards & Co., Exterior and 140th streets, has let contract to Barney Ahlers Construction Corp., 110 West Fortieth street, for a 1-story addition.

NEW YORK—Eagle A & B Eliminator Co. has been incorporated with $100,000 capital to manufacture radio appliances by D. Theodore, M. Blumberg and J. Kramer. S. A. Fried, 291 Broadway, is attorney.

NEW YORK—Home Bed Spring Mfg. Co. has been incorporated with $5000 capital to manufacture bedsprings by L. Lisichin, K. Lisichin and J. Dubrow. Feuer & Murzin, 150 Broadway, is attorney.

NEW YORK—Radio Power Corp. has been incorporated with $10,000 capital to manufacture radio apparatus and appliances by C. B. Babitt and G. W. Poillon. S. Feuer, 245 Broadway, is attorney.

NEW YORK—Vitolyzed Air Corp. has been incorporated with $1,000,000 capital to manufacture cooling devices for buildings by H. L. Cohen, F. Ellenbogen and J. Frakt. J. Schulz, 522 Fifth avenue, is attorney.

NEW YORK—Kayess Aircraft Engineering Corp. has been incorporated with $500,000 capital by A. B. Norwalk, H. B. Norwalk and L. L. Kaess. Gilbert, Campbell & McCool, 14 Wall street, are attorneys.

NEW YORK—Duplex Pin Co. has been incorporated with $10,000 capital to manufacture hairpins by D. S. Markel, B. Levy and I. D. Neustein. Byrnes, Neustein & Ross, 277 Broadway, are attorneys.

NEW YORK—Sterlingheart Metal Works has been incorporated with $20,000 capital to manufacture metal advertising novelties by G. Cohen, and M. L. White. S. J. Szendy Jr., 261 Broadway.

NEW YORK—Metropolitan Sash Weight Co. has been incorporated with 100 shares no par value to manufacture sash weights and similar articles by S. Black, W. H. Callahan and R. W. Matthews. Cook, Nathan & Lehman, Trinity building, are attorneys.

NEW YORK—Sunflame Oil Burner Co. has been incorporated with $100,000 capital and 200 shares no par value to manufacture oil burning devices by A. G. Munyon and J. E. Berger. J. H. Hooks, 6 East Forty-seventh street, is attorney.

NEW YORK—Coinsworth Corp. has been incorporated with $10,000 capital and 30 shares no par value to manufacture automatic coin vending machines by A. R. Sherik, and J. M. Zacharias. T. H. Watson Jr., 25 West Forty-third street, is attorney.

NEW YORK—Empire Heating Corp. has been incorporated with $50,000 capital to manufacture heating and ventilating systems by A. M. Goldstein, F. J. Shannon and J. Gabor. Frost, Watson, Cass & Looby, Albany, are attorneys.

NEW YORK CITY—The Standard Oil Co. of New Jersey, has appropriated, according to reliable reports, $150,000,000 for refinery expansion over the next two years. New foundries will be erected at several points, both here and abroad, and several additions will be built. Approximately two-thirds of the total expenditure will be made during the coming year.

TONAWANDA, N. Y.—Nortonda Stove & Furnace Corp. has been incorporated with $10,000 capital to manufacture heating devices by O. A. Solomon, and V. W. Curtis. R. Baxter, North Tonawanda, N. Y., is attorney.

CLEVELAND—Cleveland Tractor Co., 20100 St. Clair avenue, is building a 2-story addition to its plant.

CLEVELAND—Cleveland City Iron & Forge Co., 4501 Lakeside avenue, suffered small loss by fire at its plant. Henry Roesinger is chief engineer.

PAINESVILLE, O.—Painesville Metallic Binding Co., M. A. Allen manager, Richmond street, is considering plans for a factory addition for spring of 1927.

OKLAHOMA CITY, OKLA.—Hughes Tool Company, 8 West Twentieth street, is doubling capacity of its machine shop for repair of drilling tools. E. C. Kinney is local manager.

PICHER, OKLA.—Golden Rod Mining Co. ore mill plant destroyed by fire with $100,000 loss. Frank Wallhouser, Wallhouser building, Joplin, Mo., is general manager.

SEMINOLE, OKLA.—Empire Gasoline Co. is adding four 170-horsepower direct connecting engine compressor units to its gasoline plant in Seminole field.

SEMINOLE, OKLA.—Ozark Pipe Line Co. has placed contract with Bessemer Gas Engine Co. for three 150-horsepower oil engine units for installation in pump station.

TULSA, OKLA.—Tulsa Boiler & Machinery Co. has constructed addition to fabricating plant, 20x120 feet, and has installed a punching machine for bubble tower work on oil refineries.

TULSA, OKLA.—Tulsa Demountable Rim Corp., capital $25,000, has been incorporated by I. D. Pilcher, 1108 Florence place, T. I. Monroe and F. W. Wildhaber to manufacture auto accessories.

TULSA, OKLA.—Oil Well Improvements Co. is erecting steel and brick plant, 100x300 feet, on Sand Springs road for new foundry and machine shop to manufacture gray iron castings. Cupola furnace equipment will be installed. C. O. Heggem is plant manager. The company's original plant remains at Collinsville, Okla.

BRIDGEPORT, PA.—Norris Iron & Wire Works has been incorporated with $10,000 capital to manufacture steel, iron, brass and bronze products by John K. Gehret, Norristown, Pa., Rolland F. Starr, Bridgeport, and Charles W. Gardner, Glenside, Pa.

CHESTER, PA.—Plans have been prepared by the Ballinger Co., Philadelphia, for a manufacturing building here for S. Price Stevenson.

HARRISBURG, PA.—Standard Iron & Steel Co. will build a 2-story plant, 40 x 100 feet, from plans by B. E. Starr, Spooner building, architect.

LANSDALE, PA.—Andale Engineering Co., 1600 Arch street, Philadelphia, is building a 1-story plant here 92 x 102 feet.

LANSDALE, PA.—Lansdale Foundry Co. Inc. has been incorporated with $100,000 capital to manufacture gray iron castings by Joseph H. Rettig, 402 East Mt. Airy avenue, Philadelphia, H. M. Rettig, and Edward B. Querner.

NEW CASTLE, PA.—National Radiator Co., R. S. Waters secretary, Johnstown, Pa., is building a foundry 180 x 356 feet, assembly and shipping building 190 x 432 feet and coke shed 24 x 130 feet.

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

Pennsylvania, No. 1	$40.00 to 43.00
Pennsylvania, No. 2	35.00 to 38.00
Ohio, No. 1	40.00 to 43.00
Ohio, No. 2	35.00 to 40.00
Illinois, No. 1	40.00 to 43.00
Illinois, No. 2	35.00 to 38.00
Kentucky, No. 1	40.00 to 43.00
Kentucky, No. 2	38.00 to 40.00
Missouri, No. 1	40.00 to 43.00
Missouri, No. 2	35.00 to 38.00
Maryland, No. 1	40.00 to 45.00
Maryland, No. 2	36.00 to 40.00
Georgia and Ala. No. 1	40.00 to 45.00
Georgia and Ala. No. 2	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Chicago	52.00
Birmingham	52.00

MAGNESITE BRICK

Per Net Ton Seaboard Base

9 x 4½ x 2½	65.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	45.00

PHILADELPHIA—Joseph Funston, Washington Square building, will start work shortly on a $15,000 factory building on Eastwick, east of Eighty-fourth street.

PHILADELPHIA—Plans are being prepared for a $1,000,000 cold storage warehouse, containing 1,300,000 cubic feet, for the Quaker City Cold Storage Co., Delaware avenue, south of Spruce street. The Ballinger Co. is engineer and architect in charge.

PITTSBURGH—Electric Home Co. has been incorporated with $5000 capital to manufacture refrigerating and other household machinery by Harry B. Wassell, 1404 Union Bank building, Pittsburgh, and others.

PROVIDENCE, R. I.—Builders Iron Foundry, Kingsley avenue, Z. Chafee president, will build a 1-story foundry.

AMARILLO, TEX.—Sante Fe railroad announces expenditure of $1,000,000 in additional track construction to Panhandle and Canyon in oil fields, 45 miles. M. C. Blanchard is chief engineer for Western Lines.

AMARILLO, TEX.—Summit Oil & Refining Co. plans building of refinery at Borger, Tex., according to announcement of officials, headed by Will A. Miller of Amarillo, president and general manager.

BEAUMONT, TEX.—Spindletop Machine & Supply Co., capital $30,000 has been incorporated by F. L. Pivoto, 2215 Hazel St., R. M. Pyron and M. E. Pivoto.

SAN ANTONIO, TEX—W. H. Winterborne & Sons Co. has been incorporated with $30,000 capital to establish and operate a machine shop by W. H. Winterborne, 321 Austin street.

RICHMOND, VA.—Day-Elder Sales Corp. has been incorporated with $25,000 capital by T. O. Campbell, Travelers building, to sell machine tools and similar equipment.

ELKHART LAKE, WIS.—Sortograph Co., manufacturer of counting machines, is building a 2-story addition 57 x 60 feet.

Business in Canada

MOYIE, B. C.—Consolidated Mining & Smelting Co. has started work on a coarse crushing plant here to cost $200,000.

NEW WESTMINSTER, B. C.—To finance installation of new machinery costing $250,000 in the mills of the New Westminster Paper Co., Ltd., formerly the Westminster Paper Mills, Ltd., has made a bond issue of $175,000. Part of the money will be used for construction of a new paper mill at Bellingham, B. C., to be known as the Pacific Coast Paper Mill, which will be operated as a subsidiary of the New Westminster Paper Co.

HAMILTON, ONT.—Master Radio & Appliance Co. Ltd. has been incorporated with $40,000 capital stock by William Lees, Thomas Hobson, Charles G. Lees and others.

LONDON, ONT.—East London Fibre Board Co. is asking for bids in connection with $35,000 addition to its factory here.

OTTAWA, ONT.—Jones & Hind Motors Ltd. has been incorporated to manufacture and deal in trucks, automobiles, motor boats and engines with $50,000 capital by James C. Hind, Howard L. Jones, Ward H. Gilmour and others.

SUDBURY, ONT.—Inkster Motor Sales Co. Ltd. has been incorporated to manufacture and deal in automobiles, motors, tractors and boats with $100,000 capital stock by James Inkster, George J. Valin and Arthur J. Manley.

LACHINE, QUE.—Linde-Canadian Refrigeration Co. has started work on excavations in connection with large addition to its plant here. The addition will be for the manufacture of the new domestic unit on a production basis. The plant will be equipped with the latest type of machinery and equipment. It is also the intention to build a foundry. The company proposes to evolve a method of progressive manufacture similar to that by automobile manufacturers.

LIMOULOU, QUE.—Anglo-Canadian Pulp & Paper Mills, Ltd. has let the general contract for the construction of huge paper mills here to the W.I. Bishop Construction Co., Montreal, Que. The proposed mill will require about 2000 tons of steel, which will be supplied by the Dominion Bridge Co., Montreal.

MONTREAL, QUE.—Johnson Wire Works has taken out a permit for addition to its plant here.

MONTREAL, QUE.—Caron Brothers Inc. has received an order for marine engines to be completed by April 1, test having shown the Caron engine suitable for marine purposes.

MONTREAL, QUE.—Montreal harbor commission contemplates building 3,000,000-bushel addition to grain elevator No. 3, on which work will start soon.

MONTREAL, QUE.—Montreal Armature Works, Ltd., 31 St. Alexander street, will build a manufacturing plant on Shannon street to cost $30,000. J. Quinlan & Co., 1135 Greene avenue, have the general contract.

MONTREAL, QUE.—Metals Corporation of Canada Ltd. has been incorporated to manufacture and deal in metal products with $20,000 capital stock by Frederick Walbank; Harry D. Stewart, Clarence H. Morris and others.

MONTREAL, QUE.—Oil Heater Corporation Ltd. has been incorporated to manufacture oil burners and oil burning machinery, with $500,000 capital stock by Albert W. Stuart, Nathan Solomon, Lewis K. Freedman and others.

MONTREAL, QUE.—Power & Mines Corporation Ltd. has been incorporated to mine, smelt and refine, ores, metals and minerals, with $1,500,000 capital and 1,500,000 shares of no par value by Colvin Sinclair, Ralph E. Allen, John W. Long and others.

MONTREAL, QUE.—Trussed Concrete Steel Co., Canada Cement building, has the general contract for reinforcing steel in connection with $5,000,000 warehouse to be erected on Craig street, for the Montreal Rail & Harbor Terminal, Ltd.

MONTREAL, QUE.—The Dominion Oilcloth & Linoleum Co., 1192 St. Catharine street, has started work on $30,000 addition to factory on Parthenais street. General contractor, Church Ross Co., Ltd., 901 Keefer building, Montreal.

MONTREAL, QUE.—Furnace Engineering Co. 5 Beekman street, New York, has incorporated the Furnace Engineering Co. (Canada), Ltd., with offices in the Imperial Theater building here. The new concern is headed by W. G. Drake, and is under the management of F. W. Pennock, with T. A. McGee as chief engineer. It is understood that a manufacturing plant will be established here and all products including a unit pulverizer will be made in Canada.

SWIFT CURRENT, SASK.—Rollefson Equipment Company Ltd. has been incorporated to carry on the business of electrical engineers, with $200,000 capital and 10,000 shares without par value, by Jacob A. Rollefson, Carolyn Rollefson, Robert Maulson, and others.

New Trade Publications

ENGINES—Diesel engines of the 4-cycle, air injection type and details of construction and design are presented in a catalog issued by the Fulton Iron Works, St. Louis.

REFRACTORIES—A folder describing the use of its refractory cement in brass furnace linings has been issued by the Botfield Refractories Co., Philadelphia.

TRAMRAILS—Handling materials by means of its tramrail systems is shown in pictorial form in a folder published by the Cleveland Crane & Engineering Co., Wickliffe, O.

CLUTCHES—A bulletin by the Conway Clutch Co., Cincinnati, calls attention to the universal uses to which its clutches can be put in industry and household service.

PORTABLE ELEVATORS—A bulletin by the Revolvator Co., Jersey City, N. J., describes its worm gear drive electric portable elevator, illustrating it by halftones and giving tables of dimensions and other data.

CORROSION RESISTANCE—Truscon Steel Co., Youngstown, O., has published a booklet describing the rust resisting properties of copper bearing steel which it uses in the various products manufactured by the firm.

DRAFT GAGES—Foxboro Co. Inc., Foxboro, Mass., has issued a bulletin on its draft gages to indicate the presence of excess air in steam plants, showing where it is present, that its presence may be remedied.

SPRING COILERS—Sleeper & Hartley Inc., Worcester, Mass., has issued a bulletin covering recent additions to its line of spring coilers, a series of machines in eleven sizes to handle cold, oil-tempered wire of various sizes.

CENTRIFUGAL PUMPS—Single-stage, double-suction, volute centrifugal pumps of several different sizes are described in a catalog issued by the Ingersoll-Rand Co., New York. Cross sections of the various parts are shown to give constructional features.

POWER EXCAVATORS—Gasoline driven excavators manufactured by the Harnischfeger Corp., Milwaukee, are illustrated and described in a bulletin issued by the Harnischfeger Sales Corp. Illustrations include a wide variety of applications of this machinery. Complete specifications of the various machines are given.

ROLLER MILLS—Raymond Bros. Impact Pulverizer Co., Chicago, has issued a catalog of its roller mills, using air separation. It is illustrated to show construction and operation of the mills in pulverizing materials for industrial use, with halftones of installations. The pneumatic feed control makes the mills automatic.

PATTERN LUMBER—Sugar Pine Sales Co., San Francisco, has published an 18-page booklet showing the uses of sugar pine in pattern construction. Seasoning and care of the lumber are given. Illustrations of the various grades of lumber also are included.

SPECTROGRAPHS AND SPECTROMETERS—Adam Hilger Ltd., 24 Rochester place, London, Eng., has published two pamphlets describing spectrographs and spectrometers for use in physical, chemical, metallurgical and radiographic laboratories. One type of spectrograph has been designed especially for rapid detection and estimation of nickel and chromium in steel under shop conditions.

They're Coming To It *Rapidly!*

Roofs of vitreous Enameled Sheet Steel in the form of mission tile, flat shingles, etc., are fast becoming more and more popular all over the land. They insure fire safety, complete and permanent weather protection and long life. Besides, they are exceedingly economical in first cost and maintenance — and add the finishing touch to the exterior beauty of the home.

Throughout the house, the use of Sheet Steel is becoming more widespread. Finished in vitreous enamel it makes an ideal wall paneling for bathroom or kitchen use. The wall can easily be kept clean and shining by simply wiping it off with a damp cloth. Sheets for use as a vitreous enameling base must have very exacting properties—a reason why manufacturers have accepted Mansfield "Wabik Metal" sheets as standard for this class of work. Scientific control by competent metallurgists results in a metal of just the right porosity to provide a permanent, unyielding grip for the enamel surface. Furthermore, "Wabik Metal" is guaranteed against warping or fracturing.

MASTER TEC BRAND

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Mansfield, Ohio

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410 Pierce Bldg., St. Louis, Mo.
1106 National City Bldg., New York, N. Y.
2002 Union Trust Bldg., Cleveland, Ohio
1504 West Venango Street, Philadelphia, Pa.

Contributing Member

SHEET STEEL TRADE EXTENSION COMMITTEE

District Sales Offices:

1403 Merchants Bank Bldg., Indianapolis, Ind.
1020 Union Trust Bldg., Cincinnati, Ohio
640 Endicott Bldg., St. Paul, Minn.
237 Rialto Bldg., San Francisco, Calif.
509 Wilcox Bldg., Los Angeles, Calif.
1426 L. C. Smith Bldg., Seattle, Wash.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	33	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

⅛ and ¾-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
8 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¾-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
4¼ to 8¾-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2½-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3½ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3½ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{32}$-inch; or lighter than 10.2 pounds per square foot to and including 7.65 pounds per square foot..... .20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{32}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull material subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet....No extras

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared wiht re-entrant angles)

Additional extra ..... .20c

Sivyer Castings can be forged and welded

SIVYER CASTINGS
DEPENDABLE

The cage for a famous circle jack—cast, successfully, for more than 10 years, in Sivyer Electric Steel.

The Final Safeguard Against Failure

For More Than Ten Years

IMPORTANT and intricate parts for many pieces of equipment that have gained fame in the mid-continent oil-fields, were first developed and made successfully by Sivyer. The cage for a famous circle jack is one of these. It has been cast steadily and successfully in Sivyer Electric Steel for more than ten years. In this particular case, it was found that increased demands from the fields necessitated a stronger metal than malleable. Forgings were impractical—open hearth steel too stiff in its molten state to form the sharply varying sections. After ten consecutive years of experience with Sivyer Steel the user writes, "—we have experienced no trouble in sustaining the excessive loads placed upon these Jacks in handling the heaviest drilling tools now in use." Sivyer Steel foundry practice and experience help to provide such an assured safeguard against failure in service.

Why Manufacturers Turn to Sivyer

The strength of Sivyer Steels and Alloy Steels have been proven—*first*, by exhaustive foundry tests—*second*, by years of service under the toughest of actual conditions.

The carefulness of Sivyer Foundry Practice is illustrated by such jobs as the circle jack cage shown on this page. Year after year manufacturers stay with Sivyer because there they obtain the things they want

They Get:

Greater Strength, Longer Life
Less danger of breakage in service
Lower machining and grinding costs,
Fewer rejects.
And the backing of a name that is famous throughout the mid-continent fields

If you are having trouble with any of your parts, send blue prints of them Recommendations will be made without obligating you in any way

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Production

IN GROSS TONS

Pig Iron

Compiled by IRON TRADE REVIEW

	—Stacks— No.	In	—Output— Total	Av.daily
			1907	
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,248	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	17,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	*69,177
			1911	
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	*63,558
			1915	
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	*81,022
			1919	
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	*83,777
			1923	
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,546,308	118,210
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860
August	418	270	3,448,886	111,254
September	418	254	3,117,526	103,917
October	418	245	3,142,642	101,375
November	418	229	2,891,191	96,373
December	418	231	2,912,527	93,952
Total			40,025,850	*109,659

	—Stacks— No.	In	—Output— Total	Av. daily
			1908	
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	*42,947
			1912	
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	*80,124
			1916	
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	*106,609
			1920	
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	*99,456
			1924	
January	414	248	3,015,480	97,273
February	414	263	3,073,619	105,987
March	410	269	3,465,389	111,787
April	410	234	3,226,107	107,537
May	411	187	2,619,986	84,515
June	411	158	2,022,836	67,427
July	411	145	1,783,457	57,531
August	411	150	1,882,986	60,741
September	411	174	2,053,617	68,454
October	411	182	2,461,727	79,410
November	411	204	2,514,979	83,832
December	411	229	2,956,389	95,367
Total			31,076,572	*84,908

	—Stacks— No.	In	—Output— Total	Av. daily
			1909	
January	406	234	1,787,473	57,683
February	407	238	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	*69,383
			1913	
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	*83,980
			1917	
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	*104,561
			1921	
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	89	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	*45,223
			1925	
January	411	251	3,372,207	108,781
February	411	256	3,214,067	114,788
March	410	246	3,571,422	115,207
April	409	221	3,211,235	107,041
May	405	196	2,933,907	94,642
June	399	191	2,679,045	89,301
July	396	188	2,665,262	85,976
August	391	192	2,707,171	87,328
September	387	200	2,725,885	90,862
October	386	209	3,017,889	97,351
November	385	220	3,023,257	100,775
December	385	234	3,249,057	104,808
Total			36,370,404	*99,645

	—Stacks— No.	In	—Output— Total	Av. daily
			1910	
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	*73,550
			1914	
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,496,325	48,236
Total			22,970,926	*62,934
			1918	
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109 112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,944	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	*105,308
			1922	
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,036,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	258	3,083,520	99,468
Total			26,850,844	*73,563
			1926	
January	385	225	3,319,789	107,089
February	382	223	2,923,850	104,423
March	377	235	3,458,171	111,554
April	376	237	3,438,805	114,627
May	376	229	3,477,820	112,187
June	372	220	3,232,478	107,749
July	372	217	3,224,663	104,021
August	372	215	3,200,723	103,249
September	371	216	3,163,269	105,442
October	373	218	3,321,177	107,134
November	.....	.....	.....	.....
December	.....	.....	.....	.....
Total			32,760,745	*107,763

Steel Ingots

Compiled by American Iron and Steel Institute

	Total	Av. daily
	1922	
January	1,891,857	72,764
February	2,071,772	86,324
March	2,814,667	104,247
April	2,902,240	116,090
May	3,218,794	119,215
June	3,127,775	120,299
July	2,952,806	118,112
August	2,629,256	97,380
September	2,818,261	108,395
October	3,410,265	131,164
November	3,430,309	131,935
December	3,300,416	132,017
Total	34,568,418	*111,511

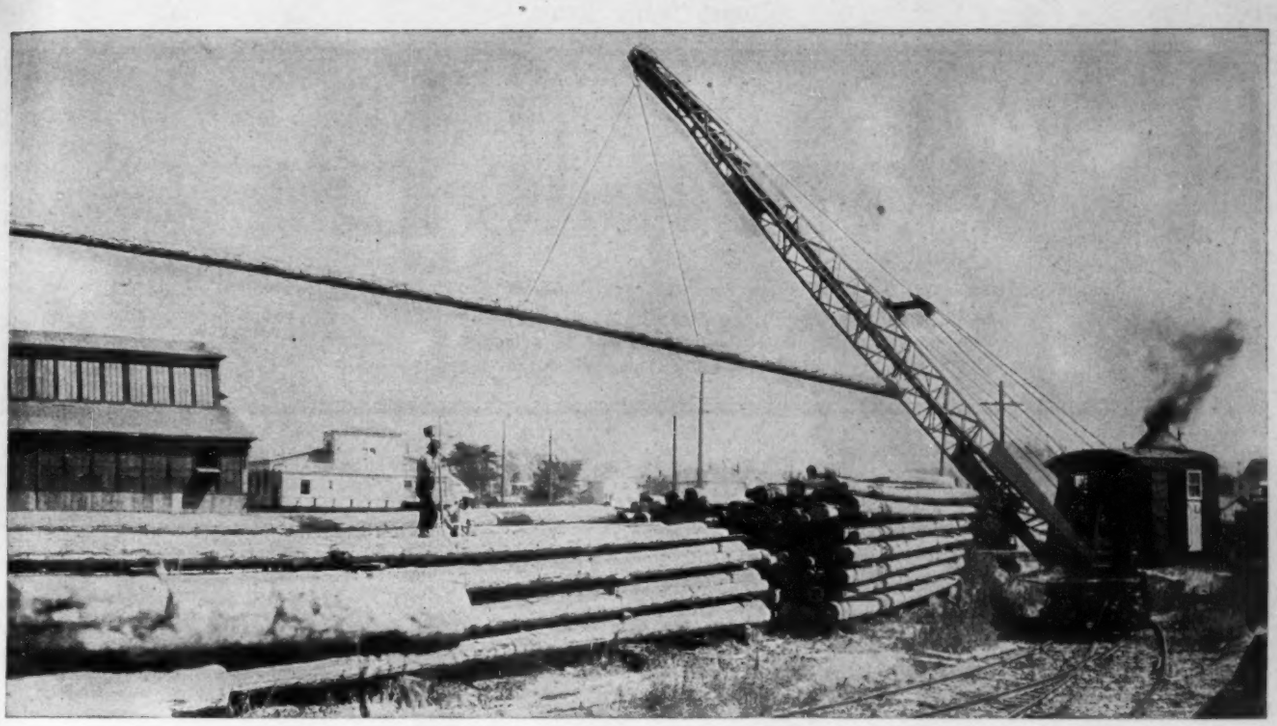
	Total	Av. daily
	1923	
January	3,841,995	142,263
February	3,471,843	144,660
March	4,066,680	150,618
April	3,968,736	158,549
May	4,216,355	156,161
June	3,767,256	144,894
July	3,531,458	141,258
August	3,695,788	136,881
September	3,356,776	134,271
October	3,577,091	132,485
November	3,134,321	120,551
December	2,863,266	114,531
Total	43,485,665	*139,825

	Total	Av. daily
	1924	
January	3,649,913	135,182
February	3,826,246	153,050
March	4,206,699	161,796
April	3,348,466	128,787
May	2,640,034	97,779
June	2,065,676	82,627
July	1,877,789	72,223
August	2,552,891	98,188
September	2,827,625	108,755
October	3,125,418	115,756
November	3,121,149	124,846
December	3,569,251	137,279
Total	36,811,157	*117,984

	Total	Av. daily
	1925	
January	4,193,281	155,307
February	3,752,352	156,348
March	4,194,340	161,321
April	3,583,676	137,834
May	3,454,971	132,883
June	3,204,451	123,248
July	3,084,472	118,634
August	3,429,998	131,577
September	3,489,565	134,214
October	3,888,814	144,030
November	3,902,900	156,116
December	3,970,918	152,728
Total	44,140,738	*141,932

	Total	Av. daily
	1926	
January	4,150,469	159,633
February	3,801,776	158,407
March	4,488,362	166,236
April	4,123,941	158,613
May	3,945,336	151,744
June	3,750,653	144,256
July	3,651,055	140,055
August	4,004,583	154,022
September	3,930,675	151,180
October	4,092,548	157,406
November	.....	.....
December	.....	.....
Total	39,939,398	*154,206

*Average.



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